# *TickWrite 7.1*

## *User Guide*

Version 20150824

## Database Management Software

For High-Frequency Global Market Data

Equities
Forex
Futures
Options
Indices
Indicators

*rev. 3.1 (2015.08.24)*

## Using This User Guide

TickWrite is a powerful data management tool that allows Tick Data clients to create data files custom-tailored to their needs. The program has many settings that can greatly alter its output, so this User Guide was developed to explain exactly how the myriad parameters available in TickWrite 7 affect the format and content of output data.

Whenever possible, the settings look the same between asset types, but a number of variations exist due to the inherent differences between equities, currencies, futures, options, and indices. The User Guide explains the settings that pertain to each asset type in separate 'Creating Files of…' sections. If a client only licenses futures data, for example, he/she can skip the sections on Equity Data, Forex Data, Options Data, and Cash Index and Indicator Data.

As a result, most users should not have to review this User Guide in its entirety. All first-time users should refer to the 'Installation' and 'Configuring TickWrite' sections for setup instructions. If you have time, review the 'First Use' section for details on all menu items. If you plan to use the Scheduler to automate updates and/or file creation, review 'Daily Updates and the Scheduler'. Otherwise, skip to the section on 'Jobs and the Job Explorer' for an explanation of the main window, and then go to the relevant 'Creating Files of…' section(s) for details on your specific data type(s).

## Welcome to TickWrite 7.1

Volumes in the financial markets are growing exponentially. Market characteristics are changing more rapidly than ever before. TickWrite 7 was designed to provide clients with the fastest, easiest, and most flexible way to generate custom ASCII files of historical intraday market data. Since trade and quote volumes vary greatly from one symbol to the next and one asset class to the next, so will the time required to generate output files. TickWrite 7 allowed us to compress more fields of information, greatly expanding the scope of data we can offer.

With TickWrite 7.1, we have further expanded the program's capabilities. Here are some of the enhancements and offerings of the new format and software:

- Expanded global futures and cash index offering, including over 90 futures contracts and 50 cash indices.
- A new ASCII-based source file format for all asset classes.
- A single program for creating custom ASCII files for all asset classes, including options.
- A convenient, familiar interface for Company Info/Ticker Mapping (CITM) clients.
- Daily updates for futures, index, and options (trade-only) data.
- Seamless integration between TickWrite, the Tick Data *Deep History* server, and the online store.
- A scheduler and downloader that work together to automatically download daily updates and generate ASCII output files.
- Sales condition information for futures data (beginning 7.1.2011).
- New Futures roll features, including *Most Active*, for more precise continuous futures contract rollovers and rolling 'n' days prior to expiration.
- Ratio Adjusting for removing rollover gaps from continuous files of futures data.
- Output timestamp in milliseconds when available.
- Ability to generate files of sub-minute bars.
- Enhanced file output options, including filtering by and re-ordering headers.
- Ability to write out bar intervals of trade data using filtered or unfiltered prices (when processed from TICK trade data).

*Please review this User Guide to ensure TickWrite 7.1 is outputting the data in the format you require.*

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## Installation

Tick Data delivers data by Internet download or external hard disk drive(s). The instructions for each method differ slightly, and are detailed below in *'Installing TickWrite 7'*, sections *1a* and *1b*.

Some users are installing TickWrite 7 for the first time, while others may be upgrading an existing installation to the latest version. In order to re-install TickWrite 7, the old version must first be un-installed, which is detailed below in *'Re-installing TickWrite 7'*. Once the old version is un-installed, the installation process is the same for a new TickWrite installation and for re-installations.

## Compatibility

TickWrite7 is available for Windows and Linux. It should run on the following OS versions:

**Windows**
Windows 10
Windows 8/8.1
Windows Server 2012
Windows 7
Windows Server 2008
Windows Vista
Windows Server 2003
Windows XP Professional (SP2)
Windows 2000 Server (SP4)

**Linux**
RedHat Enterprise Linux 5
RedHat Enterprise Linux AS 4.0
SUSE Linux Enterprise Server 10
SUSE Linux Enterprise Server 9

**NOTE: While TickWrite should run on most flavors of Linux, the only validated Linux OS is RedHat Enterprise Linux 5.**

In general, applications compiled for Linux require the following system libraries:

kernel 2.6.x
glibc 2.3 or above
NPTL 2.3 or above

## Re-installing/Upgrading TickWrite 7

*If you already have TickWrite 7 installed and are updating to a newer version, the existing version of TickWrite 7* ***MUST*** *be uninstalled first.*

### Uninstall TickWrite 7

1) If TickWrite 7 is currently open, please close the application.
2) Run the uninstaller. It can be found in the Tick Data Program Group: START –> Programs –> Tick Data – >TickWrite7 –> Uninstall TickWrite, or go to the installation directory
   (e.g. *C:\Tick Data\TickWrite7\Uninstall.exe)*
3) Select 'YES' to begin the un-installation process.
4) Once complete, click OK to close the Uninstaller window

**NOTE: Certain components will purposely not be uninstalled, such as your data, job, and output files.**

## Installing TickWrite 7

1a) **Delivery by External Hard Disk Drive:** Close all open programs. If you received an external hard disk drive(s), plug the external hard disk drive box into a USB. Go to *My Computer* on your desktop, and explore the hard drive. Download the TickWrite installer from our *Software Downloads* page: https://www.tickdata.com/support/software-downloads/. Go to step 2.

1b) **Delivery by Internet Download:** Close all open programs. If receiving the data via internet download, follow the instructions in the confirmation email, and follow the link to download the TickWrite 7 installer. That link will take you to Tick Data's website and ask you to Save or Run *TickWrite7_INSTALL.exe*. You can either save it to your computer (remember the directory you choose) or run it from the server. Go to step 2.

2) Click *Next* to begin.

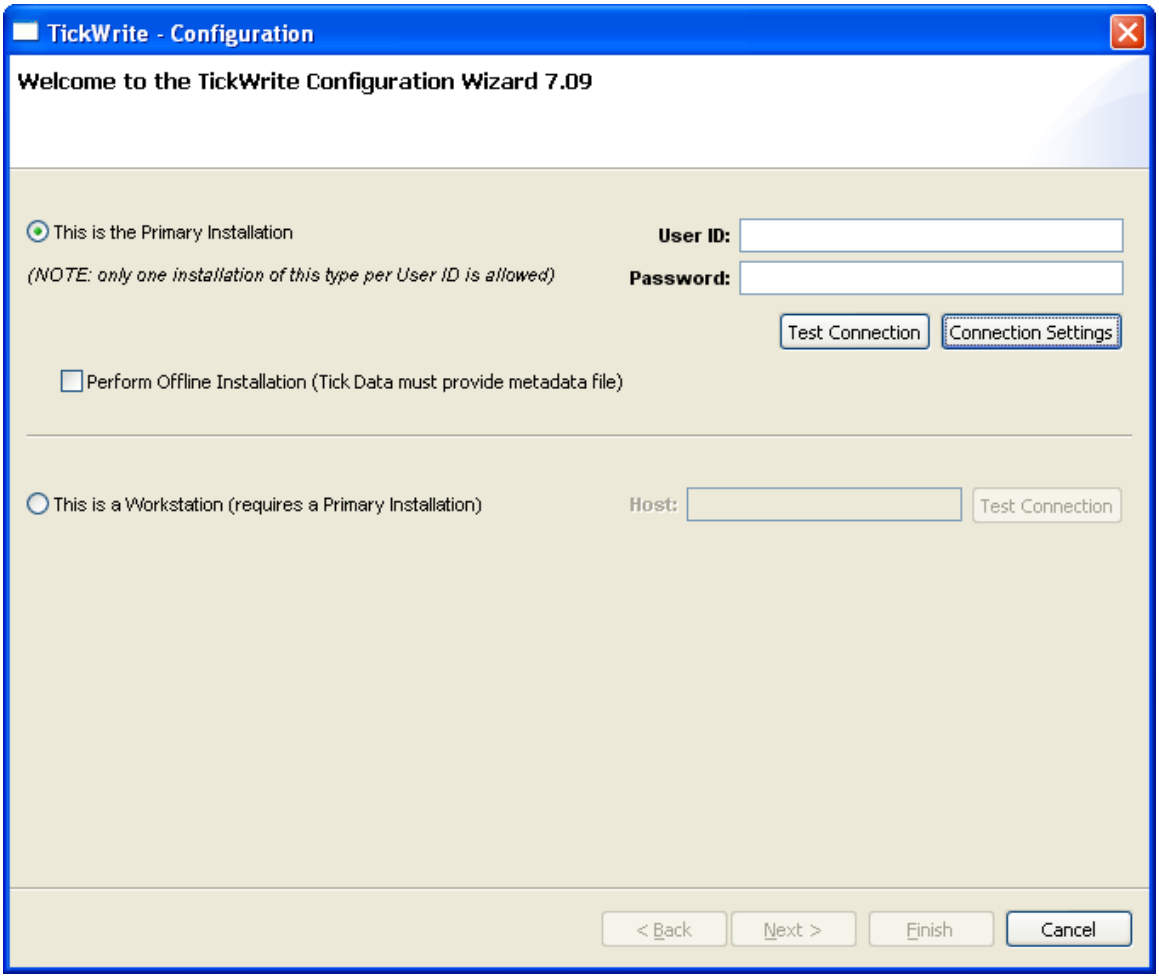
1. Read the License Agreement, and select 'I Agree' if you agree to the terms. **NOTE: Once 'I Agree' has been selected, the *INSTALL* button activates (at the bottom, left of window). Clicking this button skips subsequent installation steps and installs the software using all default settings (as described below). It is recommended to use default settings.**
2. You will then be prompted to install the application for the current Windows user only or for anyone who uses your computer. Unless you have a reason to only install it for one Windows login, select '*Anyone who uses this computer*' and click *Next*.
3. Choose the installation directory for the program (the data can be installed in a different location during Configuration), and click *Next*. **NOTE: It is strongly recommended to use the default directory, C:\TickData\TickWrite7. Also, TickWrite 7 requires that the user has WRITE access to the program directory.**
    a. **NOTE: If you are reinstalling and/or upgrading to a newer version of TickWrite, you will receive a message stating "The selected location exists and is not empty. Some files may be overwritten". As you have first uninstalled the previous version, the left over files represent your custom data and settings. Therefore, simply click Yes to continue.**
4. Select your desired Program Group (default is recommended), and click *Next*.
5. Select your preference for a desktop shortcut icon, and click *Next*.
6. Confirm your settings, and click *Next* to begin installing the files.
7. When prompted, click *Finish* to complete the installation.

Once completed, the *Configuration Wizard* will start. **NOTE: If you do not see the Configuration window on your screen, it may be behind an active window.**

## Configuring TickWrite

After installing the software, but before use, it must be configured for your Tick Data account. You will use the same User ID and Password used to log on to Tick Data's online store to complete configuration.

Here is Step 1 of the Configuration Wizard:




TickWrite 7 has two configuration options: *Primary Installation* and *Workstation*.

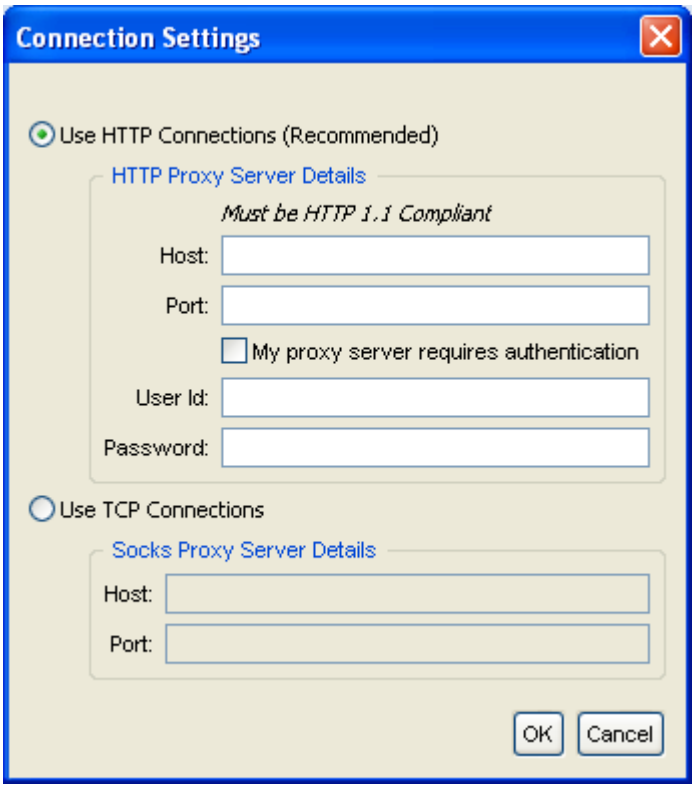
## Primary Installation

This is the most common installation configuration. Each customer must have one and only one primary installation. As many customers will have only one installation, this will be a primary installation.

Generally, you must be connected to the internet to complete the configuration wizard for a primary installation as it will download your account information and all necessary metadata from Tick Data's servers. If Internet connectivity it not possible, you will need to contact Tick Data to have a metadata file generated and sent to you. Once you receive this file, check the Perform Offline Installation checkbox and click Next. Browse to the metadata file you receive from Tick Data and it will import the metadata and allow you to continue with the remainder of the wizard.

Otherwise, if you do have Internet connectivity, you should click the Test Connection to ensure that TickWrite can reach Tick Data's servers. If this connection is not successful, you may have Internet

connectivity that is restricted by the use of a proxy server. In this case, you may need to configure the proxy server information by clicking the Proxy Server Details button. It will bring up this window:




The default choice of Use HTTP Connections is appropriate for almost all cases. However, you may need to enter an HTTP proxy server host/port and possibly a user id and password for authentication with your proxy server. If you do not have this information, please consult your IT department.

If the test is not successful even after entering the proxy information, it likely means that the connection is being blocked by your organization's proxy server or firewall. For details on the network connectivity requirements, please refer to Appendix B. You may also need to consult with your organization's network administrator for assistance if any firewall changes need to be made.

**NOTE: If you cannot successfully connect to Tick Data's server using the *Test Connection* button, do not continue with the configuration. You will not be able to complete installation of TickWrite 7.**

## Workstation Installation

If you wish to run TickWrite on more than one computer, one of the installations must be a *Primary Installation*, and subsequent machines must run TickWrite in *Workstation* mode. Workstations are designed to support multiple users co-located at a single location such as an office building (on the same Local Area Network). Installing TickWrite workstations for users in remote locations is not supported. If you require this type of setup, please contact Tick Data to obtain an enterprise license for TickWrite.

**NOTE: In order for workstations to connect to the deep history and generate data files, the *Primary Installation* computer must be accessible.**

You do not need to enter a user name and password, but will instead need to enter the host name, or IP address, of the machine on which the *Primary Installation* resides. For example, if the Primary Installation's computer has the name "tickwrite-server", you would enter "tickwrite-server" in the host

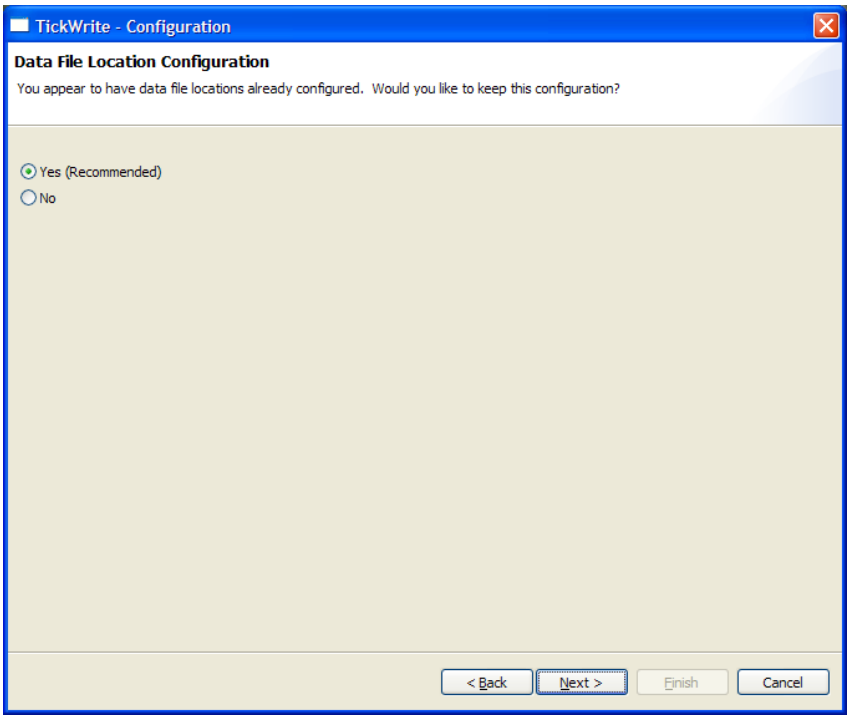
field. Alternatively, you can enter an IP address into the host field. In this case, you must install the TickWrite server installation on a machine with a static IP address.

To confirm that the host address is valid, click *Test Connection*. If the connection is not successful, it could mean that this machine cannot access the primary host or that the TickWrite Service is not running on the primary host.

Once the connection has been confirmed, click *Next*.

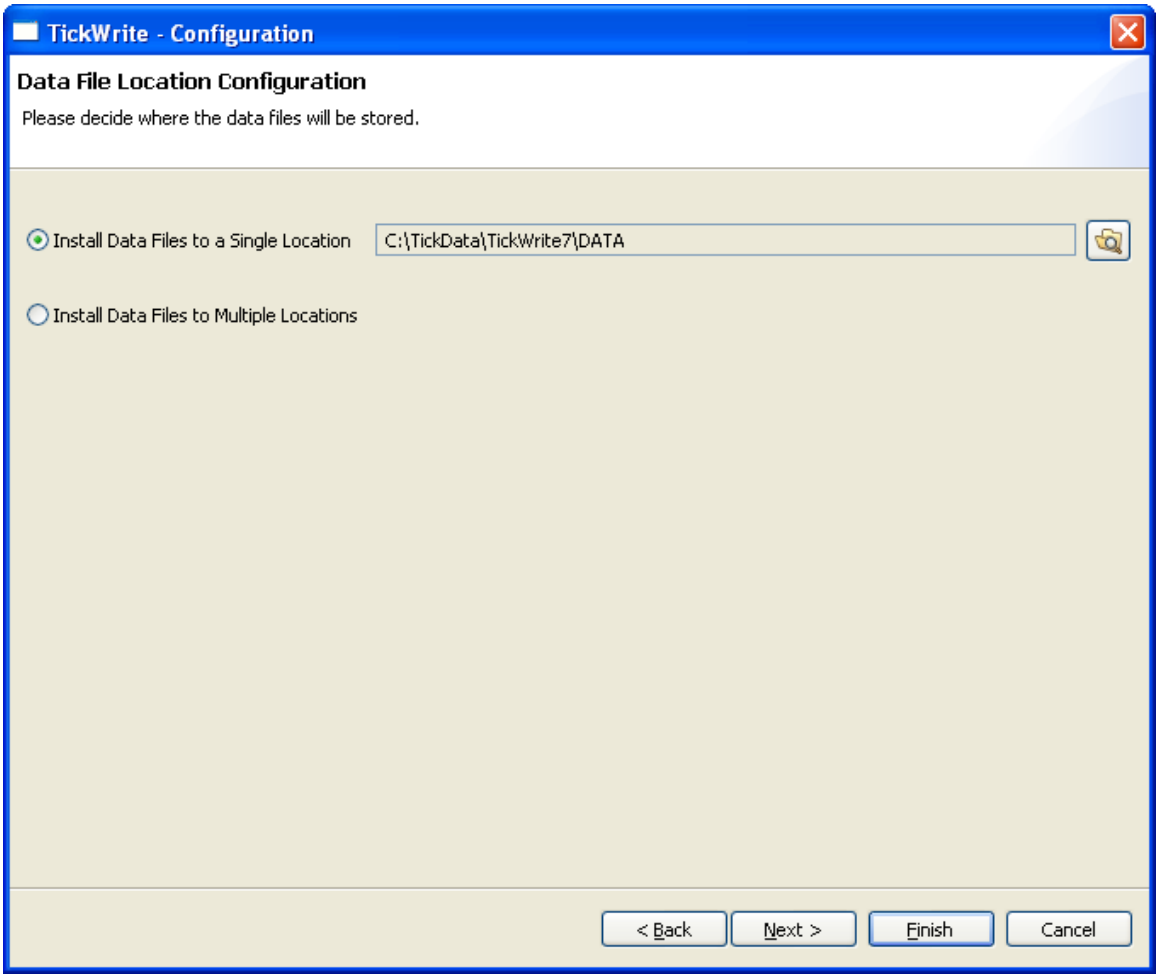
## Data File Location Configuration

If you are upgrading from a previous installation of TickWrite 7, you will be asked if you wish to keep the existing configuration:




Selecting *'Yes'* will skip the next screen and go directly to the **Finish** step.

If you select *'No'*, or if you have not installed TickWrite 7 before, you must configure a new data file location in this window:

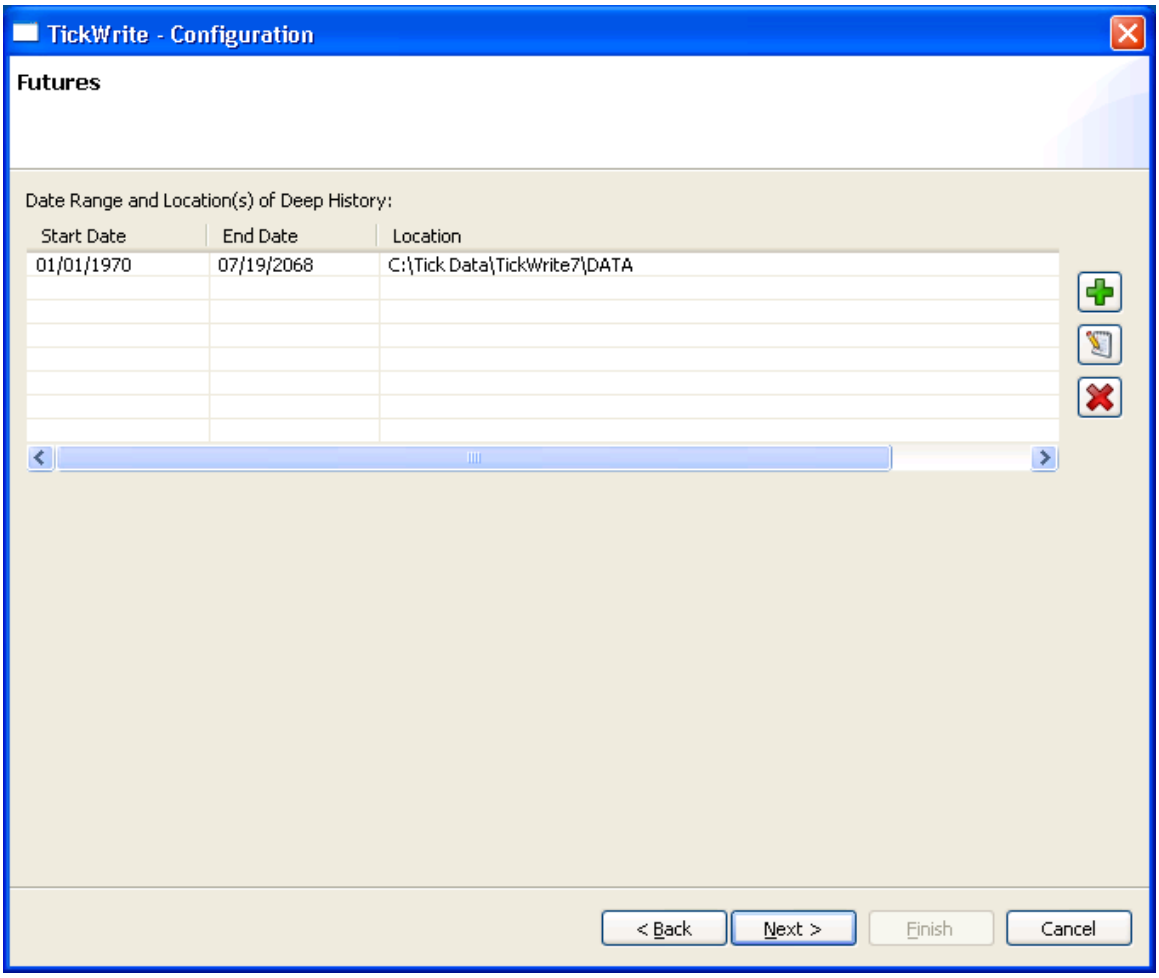



TickWrite 7 allows for the data to be stored in a single location or in multiple locations on a computer or network. **NOTE: *Deep History* file locations can be changed after configuration is complete in SETUP -> Preferences -> DEEP HISTORY LOCATIONS.**

Selecting *Install Data Files to a Single Location* gives you the ability to choose one directory on your computer or network in which all *Deep History* files will be stored. Select the desired location (the *Deep History* files will reside in subfolders of your selected directory) by browsing to or typing in the path to the directory (using the universal path to the directory if on a network or another computer).

Selecting *Install Data Files to Multiple Locations* allows data sets to be stored in separate locations. This feature is especially useful for clients who license data sets too large to fit on a single drive. Data from different time periods within the same data set can also be stored in separate locations. For example, Futures data can be stored on one drive, U.S. Equity data from 1993-2006 can be stored on a separate drive, and U.S. equity data from 2007 to present can be stored on a third drive.

Here is the configuration window for selecting multiple file locations:




To add a new location, click the green 'plus' icon. Enter the date range and path to the file location, and click *OK*. **NOTE: This location is normally a directory called *'DATA'*. In this directory should reside the data folders (i.e. FUT, IDX, US_TED, etc.). The path must point to the directory in which these data folders reside.** Existing locations can be edited or deleted using the other icons to the right of the window.

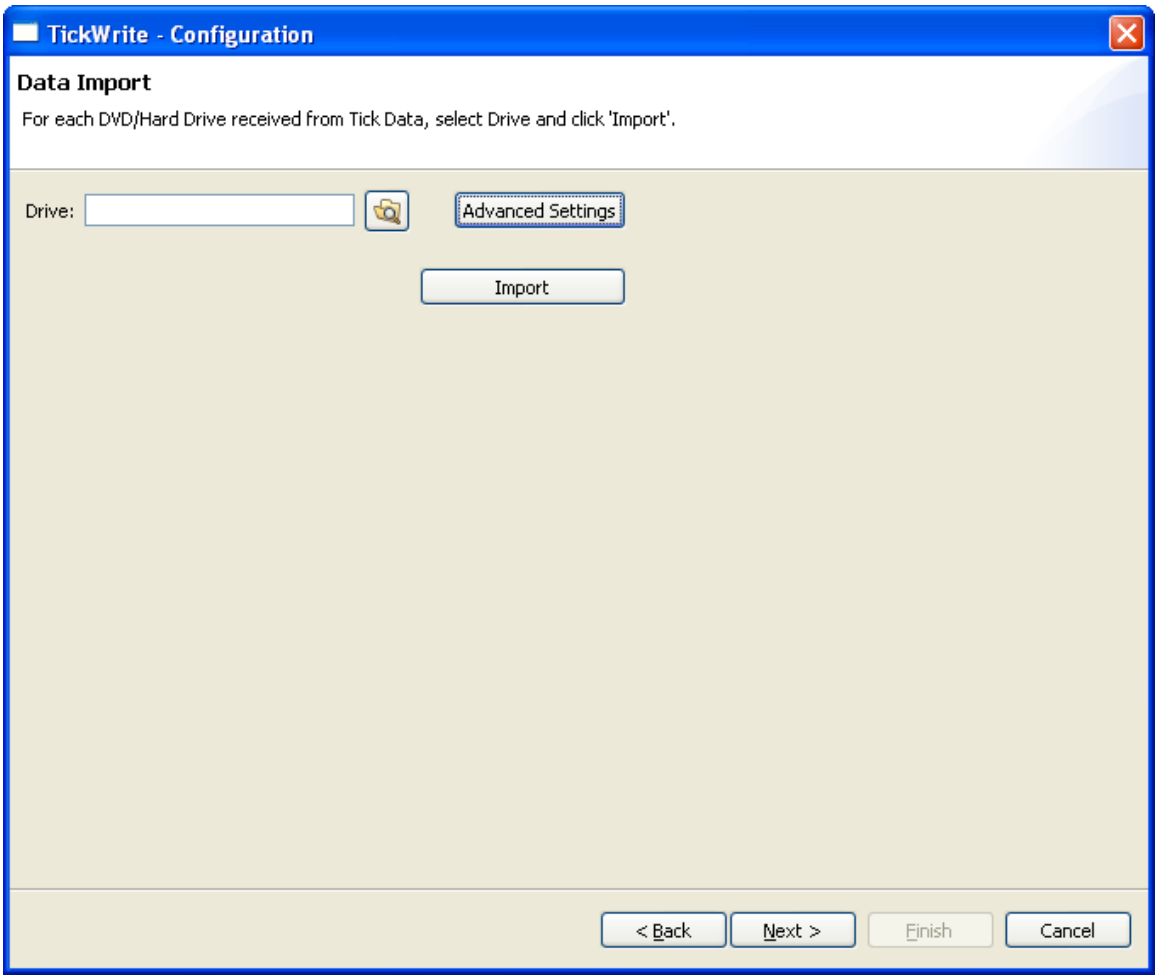
If you have multiple data sets, once you finish adding locations for one set, click *Next* to add locations for the next set.

Once *Deep History* locations have been set for each data set, click *Next* to continue. **NOTE: Data file locations must be configured for all data sets and date ranges before proceeding to next step.**

**WHEN POINTING TICKWRITE 7 TO A DEEP HISTORY LOCATION THAT IS NOT ON THE SAME COMPUTER AS THE SOFTWARE, THE *LOCATION* MUST BE SET USING UNC PATHS (i.e. \\[computer name]\[drive]\[directory]).**

## Data Import

Once the *Deep History* location(s) has been configured, you will come to the *Data Import* window:



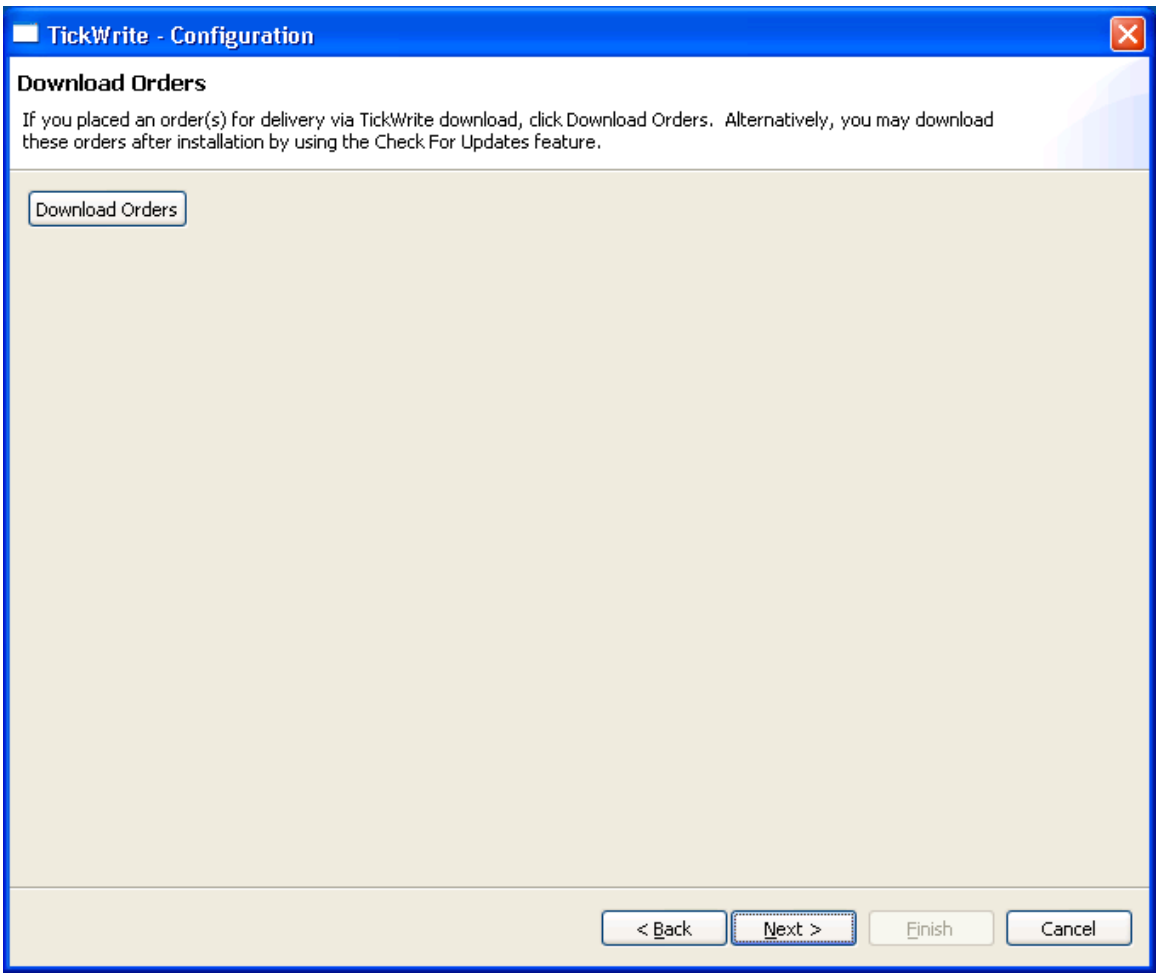

If you are installing data from a disc or hard drive, browse to the *dataimport.tdi* file included on the hard drive and click *Import*. The data will be copied to your *Deep History* location(s). If you have multiple discs or hard drives, repeat this process for each hard drive, and click *Next*.

**NOTE: The Advanced button contains special settings and should not be changed unless directly advised by Tick Data.**

If you are installing data from an internet download, leave the field blank, and click *Next*.

## Downloading Data Updates

If you are receiving the historical data you ordered via internet download, and/or if you subscribe to daily updates, the final step is to download the latest data available:




This is how clients with internet delivery will download their data. It is also how clients receiving data on disc or hard drive who subscribe to updates receive data that has become available since their orders were shipped. Click the Download Orders button to download data and/or updates from Tick Data. **NOTE: This could be a long download depending on the symbols, time period, and data type requested. Downloading can be deferred until after installing by simply clicking 'Next' without clicking the Download Orders button. Once the software is installed, download the data by clicking *Actions -> Check For Updates* in the main TickWrite window.**

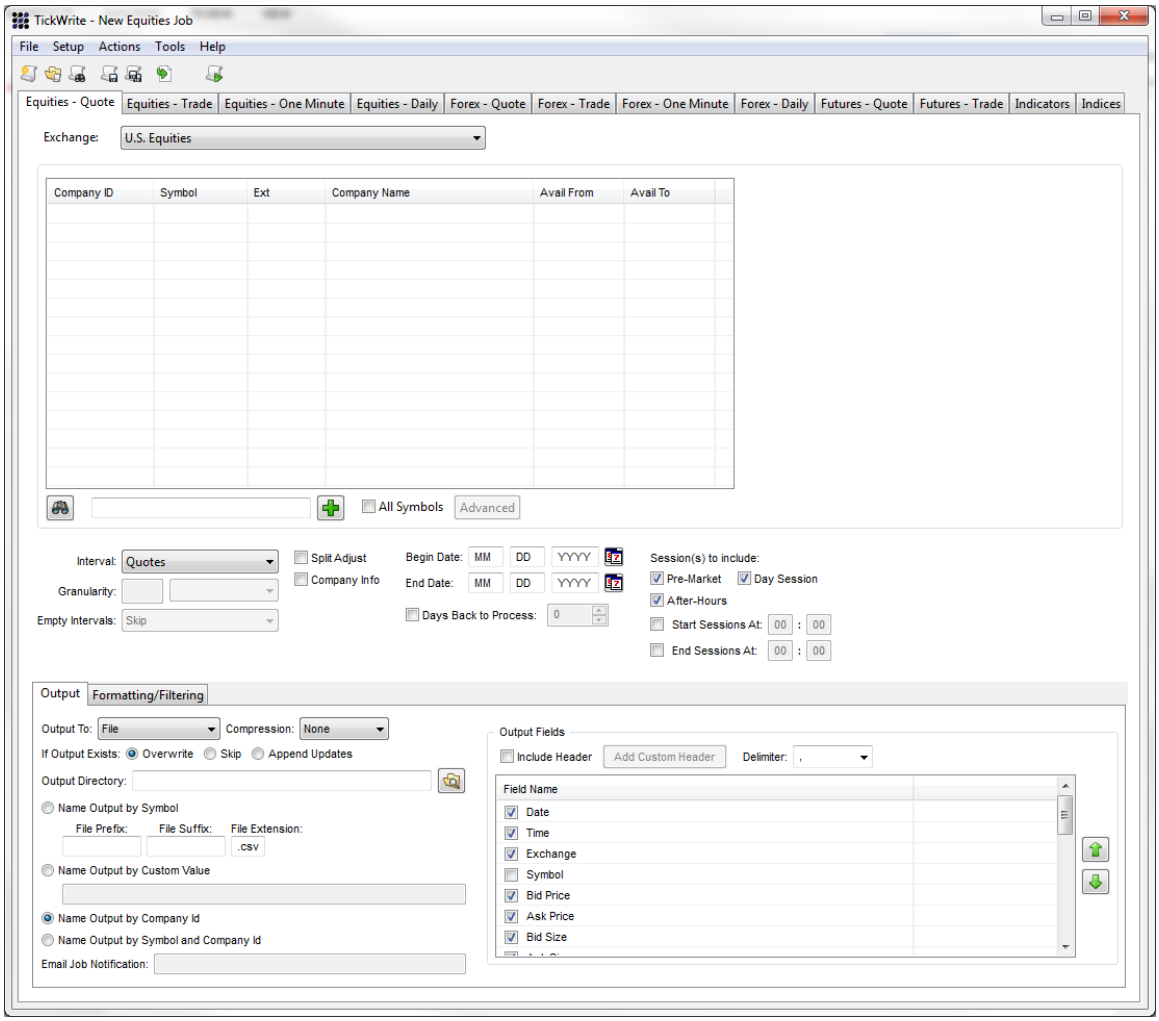
Once this step is completed, click *Next* and then when prompted, click *Finish*.

## First Use

TickWrite is a database management program that offers a number of important tools for managing historical intraday data. Its primary function is to create, or 'collect' ASCII (pronounced 'AS-key') files using the data stored on the user's hard drive in the *'Deep History'*. ASCII is a universal text format, which can be read by virtually any program. The *'Deep History'* is the location of source files used by TickWrite 7. These files can be stored on the same computer as TickWrite 7 or on a different location on the same network. In fact, TickWrite 7 allows users to store the *'Deep History'* in multiple locations. While clients can now access the source data without TickWrite, as the source data are now stored in zipped ASCII files, TickWrite 7 gives you many options for creating custom output files.

In order to create custom ASCII data files that match the user's requirements, the user creates *Jobs* for TickWrite 7 to run (see section *Jobs and the Job Explorer* for more information). The main Job window provides choices for the parameters that can be set.

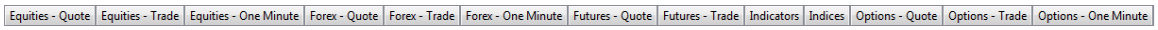
Here is the main Job window for creating custom historical data files:




In order to run efficiently, TickWrite maintains an index of all data you have purchased and installed. This registry tracks the symbols, their start and stop dates, trading session hours, the location of these files on your hard drive, and other information needed to create output files. The registry is created automatically during the installation process and is updated every time you download or import data files after installation.

## Asset Classes

When running TickWrite, the user must first select an asset class tab from the top of the window:




TickWrite currently supports Equities, Forex, Options, Futures, Indicators, and Indices. **NOTE: Tabs will only appear for the asset classes you have licensed.** For example, when available, clients with equity data will have up to three separate equity tabs: Equities – Quote, Equities – Trade, and Equities – One Minute. Each tab has specific features that are discussed in detail in the *'Creating Files of Equity Data'* section.

## Main Menu

Within each asset class, the user selects symbols, date ranges, and a number of other parameters required to generate custom ASCII files. At the top of the screen are five main menu items. The following describes each item.

### 1. File

**New Job**: Clears the current job and allows user to enter parameters for a new job. The user is asked to save the current job if changes were made.

**Open Job:** Allows user to browse for saved jobs.

**Job Explorer:** Brings up a window that lists all jobs that are saved in the default directory. **NOTE: A *Jobs* directory must first be set in SETUP -> Preferences. Using *Job Explorer*, you can run multiple jobs at once.**

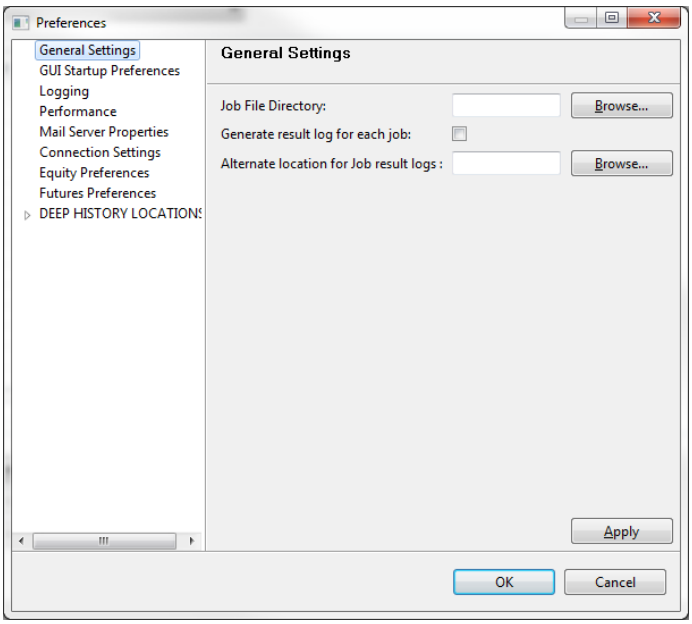
**Save Job:** Saves the current parameters for generating ASCII files as a job.

**Save Job As:** Allows user to save the current parameters as a new job.

**Exit TickWrite**: Exits the program.

### 2. Setup

**Preferences:** This is the layout of the Preferences window:



**General Settings:** Allows user to choose directories for Job files and job result logs. If no *'Alternate location for Job result logs'* is set, result log will be generated in Output directory.

**GUI Startup Preferences:** Allows user to specify location of TickWrite window after startup. This is especially useful for clients with multiple monitors.

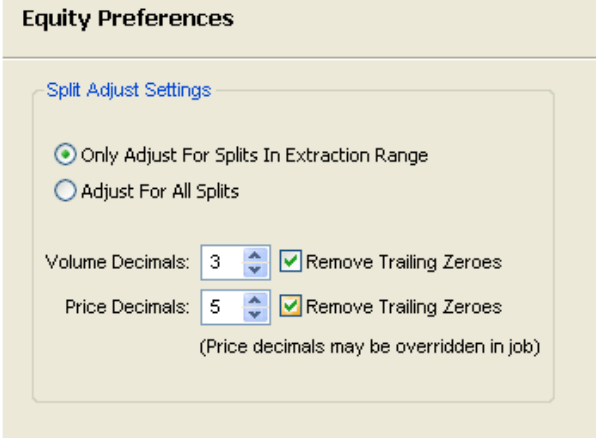
**Logging:** Allows user to set level of detail for logs. Used primarily by Tick Data Tech Support to diagnose and fix issues.

**Performance:** Allows user to specify the number of ASCII files, ZIP files, and processor threads that can be open or run at the same time. **NOTE: You should not change the default values unless advised by Tick Data customer support.**

**Mail Server Properties:** Input valid SMTP settings to allow TickWrite 7 to allow TickWrite to send out email notifications from the main Job window or the *Scheduler* (see section *Daily Updates and the Scheduler* for more information).

**Connection Settings:** Allows users to enter/edit details of a proxy server. Depending on the network configuration at the customer's site, this information may be necessary for TickWrite to communicate with Tick Data's update servers. Please consult with your IT department to obtain your proxy server information. Also, please see Appendix B for more information on the network connectivity requirements of TickWrite.

**Equity Preferences:** (for licensed Equity users only) Allows users to specify Split Adjust settings.




The first preference determines what splits will be considered when split adjustment is selected on a job. By default, only splits that occur within the extraction date range are considered. This results is data that is split adjusted as it would have been on the end date of the extraction. For example, if an extraction job is set for company ABC for 1/1/1993 – 12/31/1999, it would be adjusted for all splits occurring through 12/31/1999 but NOT adjusted for splits occurring after that date.

If, on the other hand, "Adjust For All Splits" is selected, extracted data is adjusted for all splits that occurring in a company's history, regardless of extraction range. Please note that you must have a data license on the day on which a split occurs to have an adjustment made. For example, if you purchased data for company ABC from 1/1/1993 through 12/31/1999, you would only be able to adjust for splits occurring until 12/31/1999 because you do not have a data license after that point.

The remaining settings on this page related to the number of decimal points to be used with split adjusted data. Because split adjustment calculations can often result in long floating point numbers, these settings can you the ability to round the data to your desired precision.

**Futures Preferences:** (for licensed Futures users only) allows users to specify advanced settings related to Futures contract rolling and adjustments. Please see the "Creating Files of Futures Data" section of this document for detailed explanation of these settings.

**Deep History Locations:** Upon installation, the user set locations for data types and specific date ranges. In this section, user can make changes to location(s) of source data files. For example, if a deep history becomes too large for a particular drive, the user can specify that all data after a specific date be stored in a different location. Once changed, any subsequent updates will be downloaded to the new directory. However, if the location of data for an existing date range (already downloaded and resident on the user's hard drive) is changed, the user must manually move the source files to the new location. **NOTE: If you are receiving updates for a particular market, set the end date for that asset type's entry to a date far in the future, such as 12/31/2099.**

**Tab Defaults:** By clicking *Set Current Values as Default for Tab*, the user can save every setting on the job window as defaults. These settings are specific to that tab. Subsequently, every time TickWrite is started (or a new job is created) and that tab is selected, the default settings will be selected. Clicking *Restore Factory Defaults for Tab* will clear all user-defined defaults and use defaults defined by Tick Data.

**Data Import:** Used to add data into TickWrite manually for subsequent orders delivered via hard drive. Browse to the .tdi file included on the hard drive, and click Import to transfer the data from the hard drive into TickWrite.

**Metadata Import:** Used to manually import a TickWrite metadata file provided by Tick Data. Normally, TickWrite metadata is downloaded electronically from Tick Data's update servers. However, in special cases, Tick Data may provide a metadata file that should be imported using this menu item. Browse to the .mdi file provided by Tick Data and TickWrite will import its metadata.

**Migration:** Allows the user to convert job files from TickWrite 6 format to the new format. Please see Appendix A for more information.

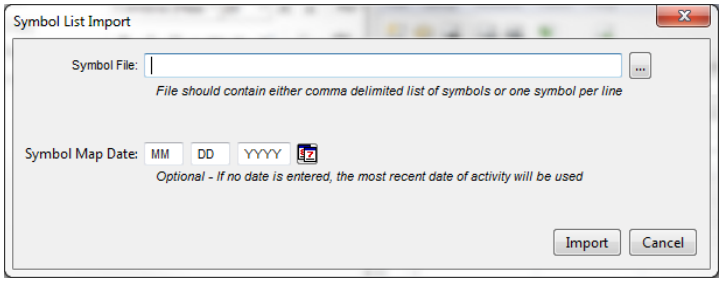
**Account Details:** Window show the user's account id and user id, as well as the type of TickWrite installation. This information may be requested by Tick Data's Tech Support team. Also allows the user to change the password for the account. Changing this password will also change the user's password for the online store. The User ID cannot be changed.

**Scheduler:** Opens the scheduler, which allows users to schedule update downloads and jobs to run automatically. See below section "Daily Updates and the Scheduler" below for more information on using the scheduler.

## 3. Actions

**Execute Job:** Runs the current job.

**Import Symbol List:** Some data collecting jobs may have many symbols. In order to select multiple symbols quickly, users can save a text file with a list of desired symbols (or Tick Data IDs). First, create a new text file in Notepad or other text editor. The file can then be formatted in two ways: type or paste one valid symbol or ID per line, or type or paste a comma-delineated list of symbols or IDs. Then save the file as a .txt, .csv, .prn, .asc, or any other text file extension. Click ACTIONS->Import Symbol List, and the corresponding symbols will be selected automatically. For equity data sets, which contain many symbols that can frequently change, a custom map date can be used by entering a date in the window:




**NOTE: Only symbols from the current asset class can be selected. TickWrite will notify the user of any symbols it cannot find.**

**Reindex:** Allows the user to manually recreate TickWrite's database of available data. This should not be necessary under normal use, but may be suggested as a remedy for certain issues by Tick Data's Tech Support team.

**Refresh Symbol List:** While not commonly an issue, if the user has multiple TickWrite installations and the one installation downloads new data, the screen on the workstation may not automatically update right away. This selection allows the user to manually refresh the list of available symbols and date ranges.

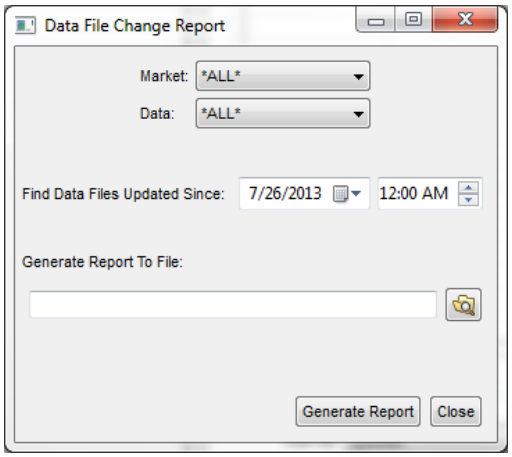
**Check for Updates:** Opens a dialogue box from which user can check for data file updates. **NOTE: User must be subscribed to Tick Data's update service and be online to receive data updates. For more information see *'Daily Updates and the Scheduler' below.***

## 4. Tools

**Update Metadata:** Downloads any new metadata (holiday calendar, exchange session times, etc.) Normally, all necessary metadata is downloaded automatically at the same time data updates are downloaded. However, Tick Data support may instruct a customer to manually download metadata to quickly resolve a specific problem.

**Data File Integrity Check:** Checks current deep history files for corruption; should only be used when advised by Tick Data customer support to search for corrupted files. If any corrupted files are detected, they may be able to have replacements downloaded automatically depending on which files (and how many) are corrupted.

**Data File Change Report:** Tick Data will at times make corrections to certain data. While these corrections will be automatically downloaded into the customer's deep history, many customers desire to know what files have been impacted since a certain point. This report gives customers a list of files that have been modified since a certain date and time. This menu item will bring up the following dialog:



The customer can choose a certain Market (e.g. Futures, US Equities, etc.) and Data set (e.g. Trades, Quotes, etc.). If a customer is licensed for multiple markets/data sets, they can use the *ALL* choice to process all markets/data sets. Secondly, a date and time must be entered. This report will include all files updated since this date and time (in the customer's local time zone). Finally, enter or browse to a file where the report should be generated and click Generate Report. Depending on the amount of data for which a customer is licensed, the report will take anywhere from a few seconds to several minutes to generate.

The change report generated is an ASCII file that is human readable but that can also be easily parsed by a script or program that the customer might choose to develop. The format is documented in Appendix E of this document.

**Data File Inventory Report:** Generates an inventory report of the data files included in the deep history. This is a diagnostic tool that Tick Data support may ask a customer to generate in order to troubleshoot a problem. It is not used by a customer during normal use of TickWrite.

## 5. Help

**User Guide:** Opens this User Guide.

**Tick Data Website:** Opens a web browser to Tick Data's home page if the user is online.

**Online Store:** Opens a web browser to Tick Data's online store if the user is online.

**Test Connection to Update Server:** Tests your ability to connection successfully to Tick Data's update server.

**Send Email To Tick Data:** Opens a dialog for sending for e-mail a message to Tick Data customer support and easily attaching relevant files that might be required for troubleshooting. **NOTE: Mail Server Properties under Setup -> Preferences must be correctly configured before using this feature.**

**About:** Displays version and build information of TickWrite 7 (the version number is in the title bar of this dialog).

## Menu Bar

Below the Main Menu is a menu bar with shortcuts to the most commonly-used menu items:

**New Job**

**Open Job**

**Job Explorer**

**Save Job**

**Save Job As**

**Import Symbol List**

**Run Job**

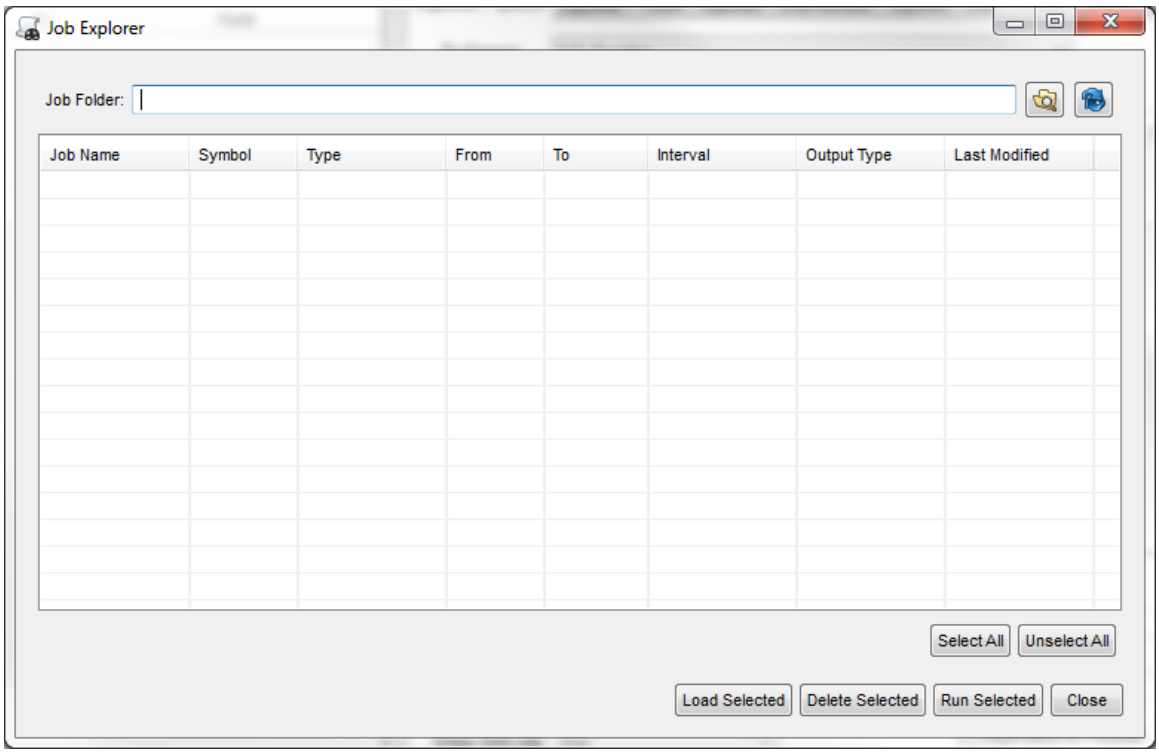
## Jobs and the Job Explorer

*Jobs* are created by selecting symbols, dates, and processing parameters on the main Job window. These can be saved to a directory and opened to quickly retrieve the parameters and run a process again. This is especially useful if a client subscribes to daily updates and wishes to run the same job each night once the database has been updated. The process can be further automated by using the *Scheduler* to automatically download updates and then run a Job to create custom ASCII files, all without the user even interacting with the TickWrite user interface (see section *Daily Updates and the Scheduler* for more information).

Once all of your symbols, dates, and parameters are set, either click *FILE-> Save Job,* Ctrl-S, or to save the Job. If you select a Job name already in use it will ask if you wish to overwrite it. To save a job with a new name, click *FILE-> Save Job As* or to bring up a dialog box and select a new Job name.

Once you have multiple Jobs saved, they can be easily viewed, selected, or run (including batching multiple jobs to run sequentially) by opening the *Job Explorer*. This can be opened by clicking *FILE-> Job Explorer*, Ctrl-J, or .

Here is the layout of the *Job Explorer* window:




The Job Explorer displays all TickWrite jobs residing in the Job Folder. The Job Folder can be changed by browsing or typing into the Job Folder text field. Click the button to refresh the contents of the Job Explorer. NOTE: The default Job Folder is specified in Setup -> Preferences-> General Settings. For convenience, Tick Data recommends that you set up a default job folder and save all jobs in that folder.

By using the *Ctrl* and *Shift* keys, multiple Jobs can be selected at once for processing. **NOTE: Only one Job can be selected at a time if you wish TickWrite to open the job by clicking *Load Selected*.**

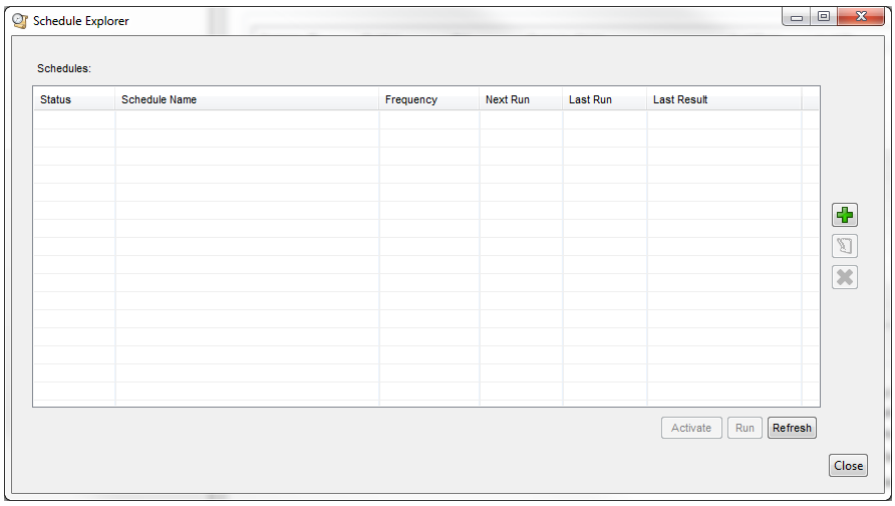
## Daily Updates and the Scheduler

**NOTE: Please review Appendix C (Windows) or Appendix D (Linux) for important, platform-specific information regarding the use of the TickWrite Scheduler.**

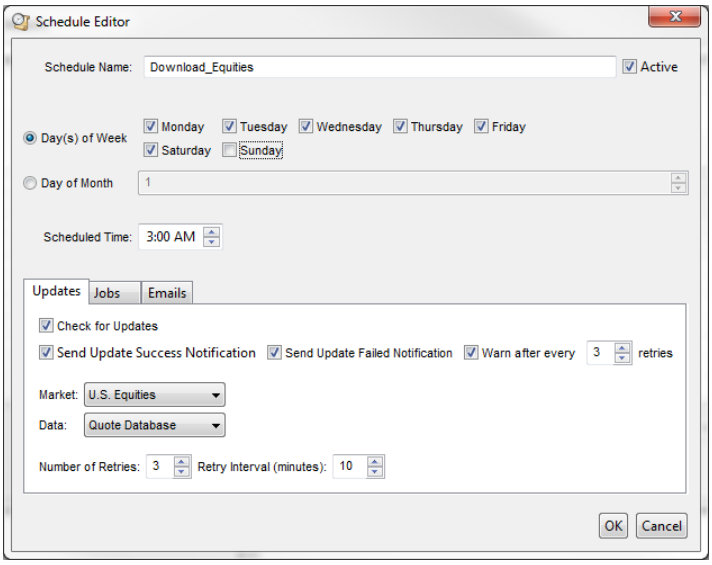
The Tick Data *Deep History* can be kept up to date by subscribing to Tick Data's daily update service. Available for equities, Forex, futures, indices, indicators, and options, this service allows clients to download data files each day to keep their databases up-to-date. For more information about subscriptions, please call Tick Data or visit our website.

TickWrite can be set to automatically download data at a specific time and day, and even run Jobs once the data has been downloaded, using the *Scheduler*. Data can also be downloaded directly from the TickWrite user interface without using the scheduler. To manually download updates, click *ACTIONS -> Check for Updates*.

The *Scheduler* is an easy way to automate the processes of downloading data and creating custom ASCII files. The *Scheduler* allows users to schedule downloads and Jobs separately or group them together to download updates and immediately start a Job or Jobs. Once a Job or Jobs have been created on the main processing window of a particular asset class, click *ACTIONS-> Scheduler* to bring up the *Schedule Explorer*:




The *Schedule Explorer* displays all scheduled items, along with their Active/Inactive status, frequency, information on when they run, and each operation's last result. By clicking or right-clicking on a *Scheduler* item, you can edit, delete, activate/deactivate, or run immediately. Click the green plus sign on the right to create a new *Scheduler* item, or click *Edit*, and it will bring you to the *Schedule Editor* window:




The top section of the *Schedule Editor* window lets you set the name, day, frequency, and time for the item. **NOTE: Once an item is created, the name cannot be edited.** You can schedule updates to run on certain days of the week or once a month. For example, you could configure a task to run every day at a certain time by selecting *Day(s) of Week* and checking every weekday. To have a scheduled task to run just once a week, only check the desired day of the week. Finally, to have a job run once a month, select *Day of Month* and enter the appropriate day of the month.

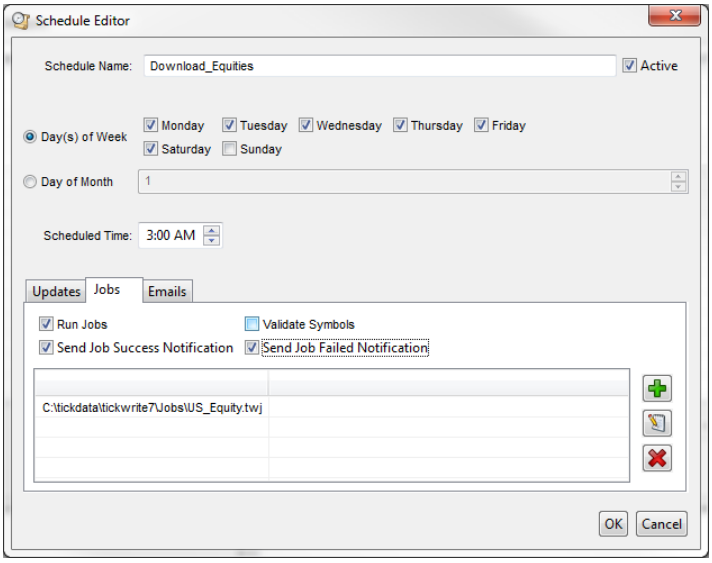
At the bottom of the window are three tabs: *Updates, Jobs,* and *Emails*.

The *Updates* tab, as seen above, can be activated by checking *Check for Updates*. When activated, it will use the day and time settings to download daily updates. Only one market and data type can be set per *Scheduler* item. If data for the current day is not yet available when the schedule task runs, the *Scheduler* can be set to retry downloading data a specific number of times at a set interval in the case the data or server is not available. For example, if you were to set up a task to download new data at midnight and entered *Number of Retries = 5* and *Retry Interval = 30*, the task would initially run at midnight and if new data was not available, it would retry at 12:30, 1:00, 1:30, 2:00, and finally 2:30 until data was available before giving up.

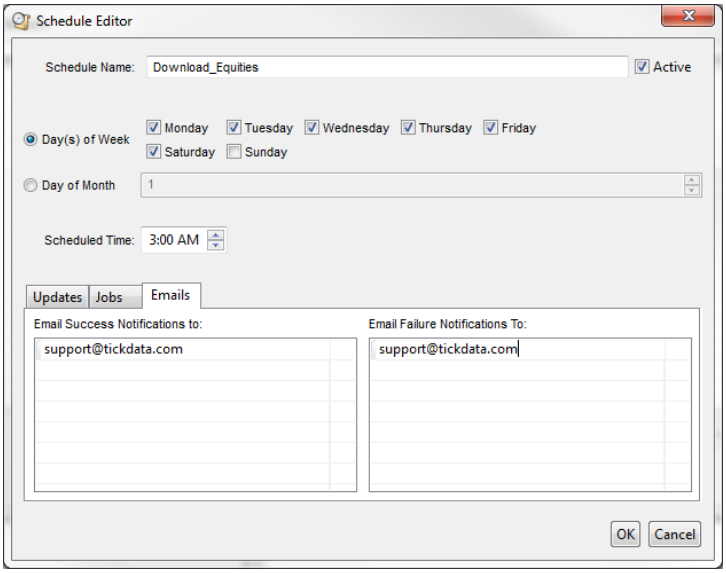
The scheduled task can also be set up to issue e-mail notifications when the download was successful and/or unsuccessful. To be notified with information on a successful data download, check *Send Update Success Notification*. To be notified with a task fails without downloading new data, check the *Send Update Failed Notification.* You will need to configure the e-mail address(es) to alert on the Email tab. **NOTE: An outgoing mail server must be set up in the Preferences window. See Mail Server Properties for more information.**

Additionally, when the task is set up to retry multiple times, a warning notification can be sent out if the download of new data fails **before** the task terminates. This allows an administrator to be notified of a failed data download preemptively while the task will continue to retry in the background. To configure this, check the *Warn after every* checkbox and enter the number of failed retries after which a warning should be sent out. For example, consider a task set up to run at midnight with 4 retries that are 60 minutes apart. If the *Warn* setting is configured for 2 retries, an administrator would be warned at 2:00 (after the first two failed attempts), then at 4:00 (after the second two failed attempts). Finally, the administrator would be notified after the final failed attempt at 5:00 if so configured.

The *Jobs* tab, as seen below, can be used to schedule a Job or Jobs to run at a set time on specific days, or to add a Job or Jobs to a scheduled automatic daily update. In the case of the latter, TickWrite will first run the download, and once successfully completed, will execute the Job or Jobs. The Job or Jobs must already be saved to be scheduled.



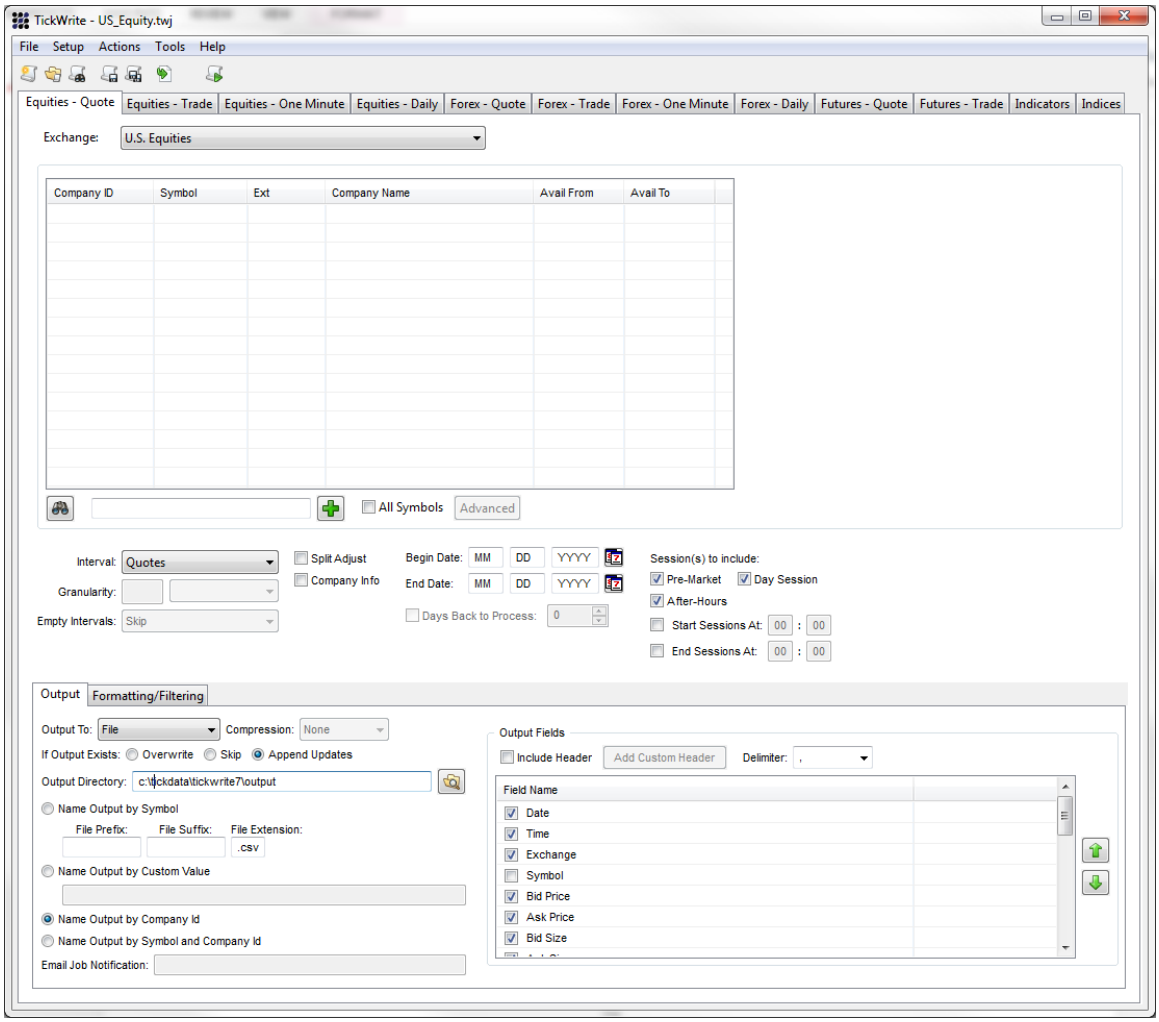

The *Emails* tab, as seen below, is used for adding email addresses to notifications. Multiple email addresses can be added for each item, and separate addresses can be used for success and failure notifications.




**NOTE: If you work in an organization with several users of TickWrite, Tick Data recommends that you create a distribution list e-mail address on your mail server to manage the appropriate e-mail addresses. This way, you can just use the distribution list e-mail address within the mail server and avoid having to modify potentially many scheduled tasks if the group of TickWrite users changes over time.**

## Creating Files of Equity Data

Here is the *Equities – Quote* Job window:



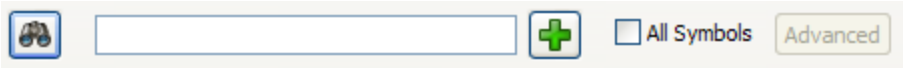

Depending on the data purchased, you may see only one equity tab titled *Equities* or multiple equity tabs: *Equities – Quote, Equities – Trade, and Equities – One Minute*. If, for example, you only purchased One-Minute Equity Data, you will only see a tab titled *Equities*. Clients receiving Tick Equity Data may also receive one-minute. These will cause both tabs to be displayed.

Each of these equity tabs accesses different data. Using the *Equities – Trade* tab provides the most versatility for processing trade-only data, and from it a user can create not only tick bars but also interval bars (i.e. one-minute bars), daily bars, weekly bars, and monthly bars. And when processing interval bars using the *Equities – Trade* tab, a user can filter output data using all of the fields of the tick-by-tick file yet write it out to interval or daily/weekly/monthly bars. However since the *Equities – Trade* tab accesses a much larger database of tick-by-tick trade data, any processing performed will take longer. Therefore, if the *Equities – One Minute* tab is available, any processing of data into files of bar intervals should be done from the *Equities – One Minute* tab, as it will perform the job considerably faster.

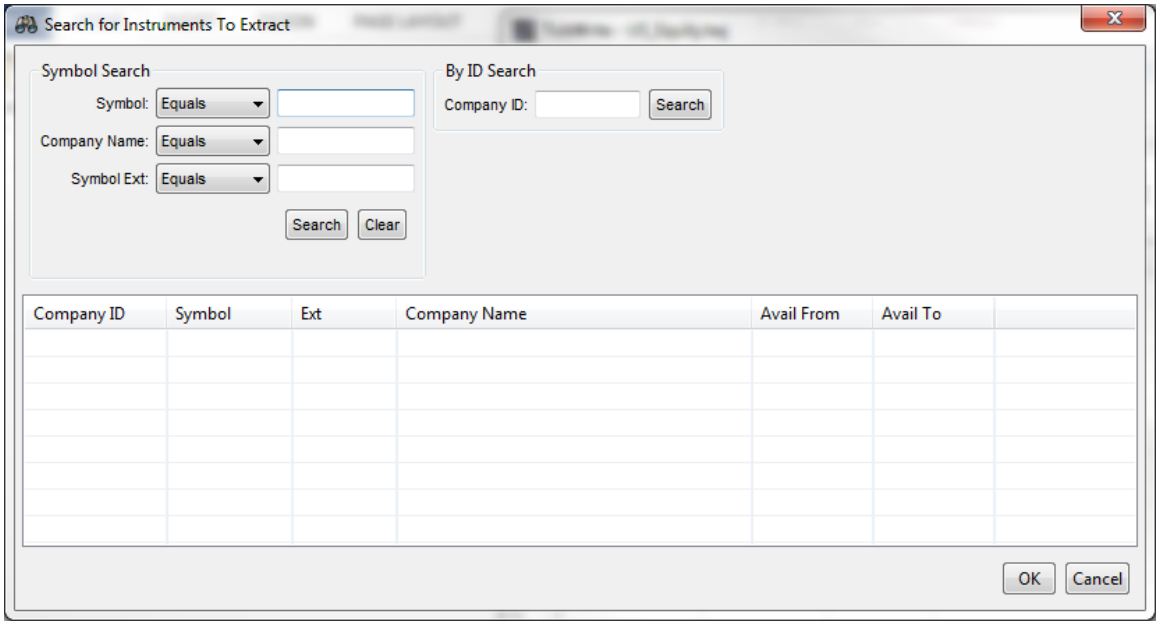
Once a tab has been selected, you must choose the *Exchange* from which you wish to process data. Again, only the exchanges for which you purchased data will be available in the list. **NOTE: the *Exchange* may be a non-exchange trading venue (i.e. MTF).** Once selected, the list of available data will NOT be automatically displayed in the symbol list, as this can represent many thousand symbols.

## Adding Symbols to a Job

The user must add symbols to the Job window for processing. Symbols can be added to the symbol list using these buttons and fields:

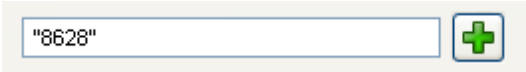



Click the binoculars to open the *Symbol Search* window:

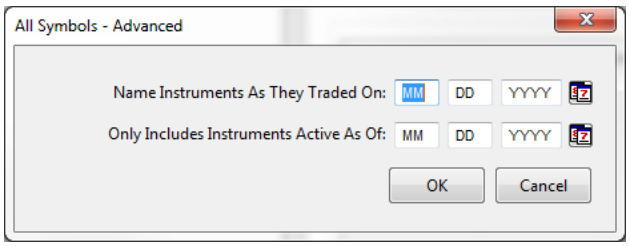



Select the desired filter parameters and click *Search*. **NOTE: leaving the fields blank and clicking 'Search' will display all available symbols.** The results will appear in the *Instrument Search Results* window. There you can select the symbols you wish to process, and they will appear in the *Symbol Search* window. Individual symbols can be removed if not desired by right-clicking on the symbol in the list and clicking *remove.* Click *OK* to add the symbols to the symbol list in the Job window.

Another way to add symbols is to type a symbol or Company ID into the quick add box (to the right of the binoculars) and click the *plus* button. **NOTE: Japanese equity symbols are numeric. These numeric symbols must be entered with quotations around them so that TickWrite doesn't mistake them for Company ID numbers. For example, Matsui Securities Co. has a Company ID 1801 and the symbol is 8628. In order to add by symbol you must type "8628".**




To include all available symbols in a processing job, check the *All Symbols* box. This will activate the *Advanced* button, which offers additional parameters for processing all symbols:



**Name Instruments As They Traded On:** Leaving this blank will use the current symbols for all companies regardless of the date range selected in the Job window. Selecting a date will use the symbology as of that date. For example, if you are working with symbols that you know to be a few years old (that may have different symbols today), you might enter a date as of a few years ago in this field so that the symbol naming convention used by TickWrite more closely matches the symbology that you are familiar with.

**Only Includes Instruments Active As Of:** Leaving this blank will result in all active and inactive symbols being included in the processing job (for the date range specified in the processing job). If you select a date, TickWrite will only process symbols that are listed on that date. For example, you may want to extract all symbols from 1995 – 2000 but include only those companies that are still trading today. In this case you would enter today's date in this field.

To check many symbols at once, you can import a list of symbols. Simply list your desired symbols in a text file, one per line, and save it as a *'.txt'*, *'.csv'*, or *'.asc'* file. Click FILE -> Import Symbol List, and browse to select your saved file. When OPEN is clicked, the symbols in the file will be checked in the data list. See section *Import Symbol List* in the *First Use* section) **NOTE: Any symbols that were listed prior to importing a list will be removed (unless they are also on the list).**

## Selecting Job Parameters

Once you have selected the desired equity symbols for processing, select the parameters in the middle of the window to suit your requirements. The screen will activate different settings depending on: 1) how many symbols are selected; 2) the *Granularity* selected, and; 3) the *Output To* selected.

The following are details for each Job window parameter:

### *Interval*

**Trades:** The output file will contain all trades tick-by-tick for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a trade occurred. Users will also note that there is no way to output 'Tick Count' when ***Trades*** is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1. **NOTE: This *Interval* setting is not available on the *Equities – One Minute* tab.**

**Tick Based Bars:** Users can also write data out as multi-tick bars. When ***Tick Based Bars*** is selected, users can define the number of ticks that will comprise each bar, instead of using a time interval to constrain a bar. In the *Granularity* box, you must specify the number of ticks per bar. Each line of data in the output file is time-stamped with the time of the last tick in each bar.

**Time Based Bars:** When selected, TickWrite outputs files of any desired intraday time interval from 1-second bars up. **NOTE: This is trade data only, as TickWrite 7 cannot write out time based bars of quote data. Each line of data can contain Date, Time, Open, High, Low, Close, Volume (if available), Tick Count, Up Ticks, Down Ticks, and/or Same Ticks for that interval. In the *Granularity* box, you must specify the length of a bar interval in whole seconds or whole minutes. Adjacent is a field to select MINUTES or SECONDS.**

The timestamp for each interval represents the data of the period ending immediately prior to the timestamp. For example, when using 5-minute bars, the 8:35 bar contains data from 8:30:00 to 8:34:59. As another example, when using 30-minute bars, the 4:00 bar contains data from 3:30:00 to 3:59:59.

**Daily/Weekly/Monthly Bars:** These intervals will output files of 1-day, 1-week, or 1-month intervals, respectively.

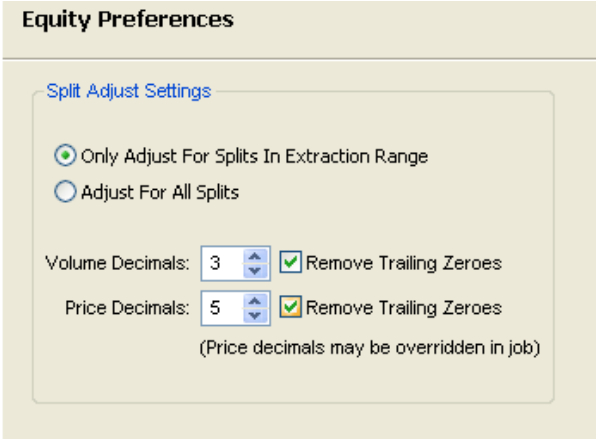
**Quotes:** The output file will contain all quotes (Level I bids and offers) for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a trade occurred. Users will also note that there is no way to output 'Tick Count'

when *Quotes* is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1. **NOTE: This *Interval* setting is not available on the *Equities – Trade or Equities – One Minute* tabs. Quote data is much larger in volume and size than Trade data, and therefore processing times will be considerably longer.**

## *Split Adjust*

Checking this box will cause the output file(s) to be adjusted for stock splits and stock dividends. If the box is unchecked, the output file(s) will not be adjusted and split gaps will exist in the prices. However, the split and dividend information can be obtained by checking *Company Info* (discussed below). For clients planning to add data to a database and analyze data pre-split, this may be a better option than adjusting.

When checking this box, there are a few other global settings that will impact the output from the job. To configure these settings, go to the Setup menu and select Preferences. Select the Equity Preferences item. This displays the following split adjust related settings:




The radio buttons determine what splits will be considered when adjusting. By default, only splits that occur within the extraction date range are considered. This results in data that is split adjusted as it would have been on the end date of the extraction. For example, if an extraction job is set for company ABC for 1/1/1993 – 12/31/1999, it would be adjusted for all splits occurring through 12/31/1999 but NOT adjusted for splits occurring after that date.

If, on the other hand, "Adjust For All Splits" is selected, extracted data is adjusted for all splits that occurring in a company's history, regardless of extraction range.

**NOTE: that you must have a data license for the day on which a split occurs to have an adjustment made. For example, if you purchased data for company ABC from 1/1/1993 through 12/31/1999, you would only be able to adjust for splits occurring until 12/31/1999 because you do not have a data license after that point.**

Also, when adjusting for stock splits, both price and volume are adjusted which can often cause these field to become long decimal values. You can configure the number of decimals to use for each field here. Additionally, you can configure whether trailing zeroes should be removed. For example, if price decimals is set to 4 and an adjusted value is calculated to be 10.25, selecting Remove Trailing Zeroes will result in a printed value of "10.25", whereas leaving this option unchecked will result in the printed value "10.2500".

Setting number of decimals to zero will result in the value being rounded to the nearest whole number. For example, if it is not desirable to have fractional volumes, the Volume Decimals can be set to zero to prevent this (in this case the Remove Trailing Zeroes setting has no effect).

**NOTE: The price decimals set above are always overridden by a Price Decimals value supplied in the job file (see the Formatting/Filtering section below).**

## *Company Info*

Will include a folder in the *Output Directory* that contains information about each security processed in the Job, including splits, dividends, and mergers, as well as translation information for converting Tick Data Company IDs to current ticker symbols. For more information about the contents of the *CompanyInfo* folder, please see the *File Format Guide* for the corresponding exchange, located on your data disc/drive and also available on Tick Data's website: http://www.tickdata.com/html/downloads.shtml

## *Empty Intervals*

These selections are not active when **Trades, Tick Based Bars, or Quotes** are selected as the *Interval*. For all other intervals, they give important options for handling empty time intervals. Empty intervals occur when there are no trades during the full length of a bar.

**Skip Empty Intervals**: Any interval without data is excluded from the file. There will not be a timestamp. The only drawback to this method comes if a user is working in a spreadsheet, as there will not be an equal number of prints each day.

**Hold Last Value:** Holds the value of the close of the last bar to have a price through all intervals until another price occurs. This guarantees the number of bars per day is constant, but creates artificial bars.

**Fill With Zeroes:** Any empty interval will have a zero (0) value for the Open, High, Low, Close, and Volume. This also guarantees the number of bars per day is constant, but if it is graphed, the zeroes will cause the chart to be useless.

## *Extend Last Interval*

Active when *Time Based Bars* is selected at the *'Interval'*, this parameter is useful if there are not an even number of intervals in a single day, based on the bar interval the user selected in *Granularity*. For example, the U.S. stock market opens at 9:30 and closes at 16:00 EST. If the user selects '60' for the *Granularity*, there is not an even number of 60-minute bars in the day. If *Extend Last Interval* is not checked, there will be a 16:30 bar that only contains 30 minutes of data (15:30:00-15:59:59). However, if **Extend Last Interval** is checked, the last bar of the day will be a 15:30 bar that contains 90 minutes of data (14:30:00-15:59:59).

## *Ignore Filtered Prices*

Active when creating **Tick** or **Time Based Bars** from *Tick Trade data*, this parameter allows the user to generate bars using raw, unfiltered prices. If unchecked, bars are built using prices that may be altered by Tick Data's proprietary price filtering algorithm. **NOTE: Also see section on *Formatting/Filtering* tab for information on 'Use Excluded Records in Output' parameter.**

## *Begin Date/End Date*

By default, the begin and end dates will both say *MM DD YYYY*. When *MM DD YYYY* is displayed, the complete date ranges for each individual symbol in the list of checked symbols will be used by the corresponding symbol. However, this can be overridden by entering begin and/or end dates in the appropriate boxes.

The buttons to the right of the *YYYY* field will pull up calendars that can assist users to enter dates.

### *Days Back to Process*

Instead of creating a file with a specific date range, a user may want to look at data only for the past *x* days. This setting is especially useful if such a client subscribes to daily updates, as a file can be updated automatically each night to only reflect trading for the past *x* days.

### *Session(s) to Include*

Many stock exchanges offer extended trading hours in addition to their regular trading hours. In the U.S. regular market *Day Session* hours are 9:30 to 16:00 EST. However, trading in the *Pre*-Market session begins several hours earlier, and *After-Hours* trading continues for several hours. In order to include *Pre-Market*, *Day Session*, and/or *After-Hours* trading in output files, users simply need to check the appropriate box(es).

### *Start Session At/End Session At*

By default, the *Start Sessions At* and *End Sessions At* fields are inactive and display *00:00.* Set this way, TickWrite will write out all of the data for the sessions chosen for each day. If the user selects multiple symbols, the file for each symbol will be written out with the respective session hours of each. However, users can also confine the data for all selected symbols to a particular time range each day.

To activate these fields, check the boxes to the left of the *Start Sessions At* and/or *End Sessions At* fields (you can use either or both). Then enter the desired hours and minutes in 24-hour (military) time.

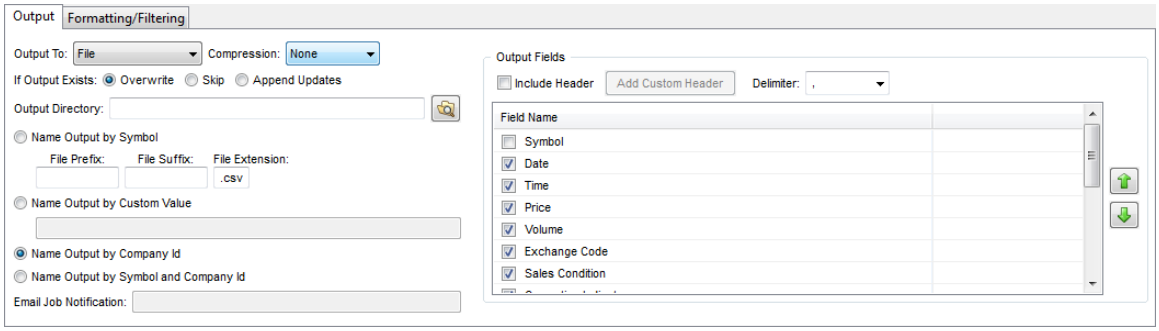
**NOTE: These fields can only be used to *restrict* normal market hours (including day and night sessions).** For example, if normal markets hours run from 07:00 – 19:00, the Start Session At must be equal to or after 07:00 and the End Session At must be equal to or less than 19:00. The custom session hours may not cross over two market days.

**NOTE: Using *Start Sessions At* and/or *End Sessions At* will deactivate the *Pre-Market/Day Session/After-Hours* checkboxes under *Session(s) to Include*, as the times entered will override the standard session settings.**

### *Output and Formatting/Filtering*

The bottom section of the Job window contains two tabs with parameters for output type, file naming, output fields, and formats.

#### Output Tab:




**Output To:** Output data to a file or to the screen. If *File* is selected, the user must select the Output parameters on the tab. If *Screen* is selected, all other Output parameters deactivate (except for the *Output Fields* section). Screen output data can be copied in the window (select multiple fields using the *Shift* and *Ctrl* buttons) and pasted into spreadsheets and text editors

like **Word** or **Notepad. NOTE: Pasted data will use the *Delimiter* set in *Output Fields*; in order to copy fields into separate cells in a spreadsheet, use *Tab* as the delimiter.**

**Compression:** The user can write out ASCII files that are unzipped (full-size output files) or compressed using *Zip* or *Gzip*.

**If Output Exists:** Determines how TickWrite will handle file creation if a file by the same name already exists in the output directory.

> **Overwrite Existing**: The existing file will be deleted and recreated according to the parameters in the job. The user will not be warned that the existing file will be overwritten.
>
> **Append Updates:** When selected, TickWrite will attempt to append data in an existing file using data generated by the job. This selection should primarily be used by clients who subscribe to daily updates and have jobs scheduled to download and process out the same data every day. It will decrease processing time, as the job will begin where the existing file leaves off.
>
> **Skip:** The extraction job will leave the existing file untouched and not extract new data.

**Output Directory:** Enter the desired location of output files. This must be chosen prior to processing data to a file. As with all parameters, this location can be set as a default by selecting SETUP -> Tab Defaults -> Set Current Values as Default for Tab. **NOTE: As with all defaults, the *Output Directory* set in a tab will only affect that tab.**

**Name Output by Symbol / Name Output by Company Id / Name Output By Symbol and Company id:** Will use the symbol and/or company ID of the instrument as the filename. These options also allow users to include a file prefix and/or suffix and select the file extension.

**Email Job Notification:** Once you have entered valid SMTP server settings in *Preferences*, enter a valid email address in this field to email notifications of Job success or failure, along with an attached .twj Job file.

**Name Output by Custom Value:** Allows the user to choose the filename of the output ASCII file. **NOTE: Active only when one symbol is selected.**

**DATE WILDCARDS IN FILE PATHS:** TickWrite7 supports date wildcards that can be used in the output directory, file prefix, file suffix, and custom file name. The wildcards will resolve to the current date and/or time as of when the collection job is first executed. This can be used to dynamically create new directories/files based on the current date without the need to create custom scripts. To utilize a wildcard, it must be denoted by ${ and } in the literal value. The following are the supported wildcards:

> **yyyy – current year**
>
> **MM – current month**
>
> **dd – current day of month**
>
> **HH – hour of day (0 – 23)**
>
> **mm – minute of hour**

For example, the following output directory might be entered:

**C:\temp\${yyyy-MM-dd}\TRADES**

Assuming that today is April 16th, 2010 this would resolve to the following directory name:

**C:\temp\2010-04-16\TRADES**

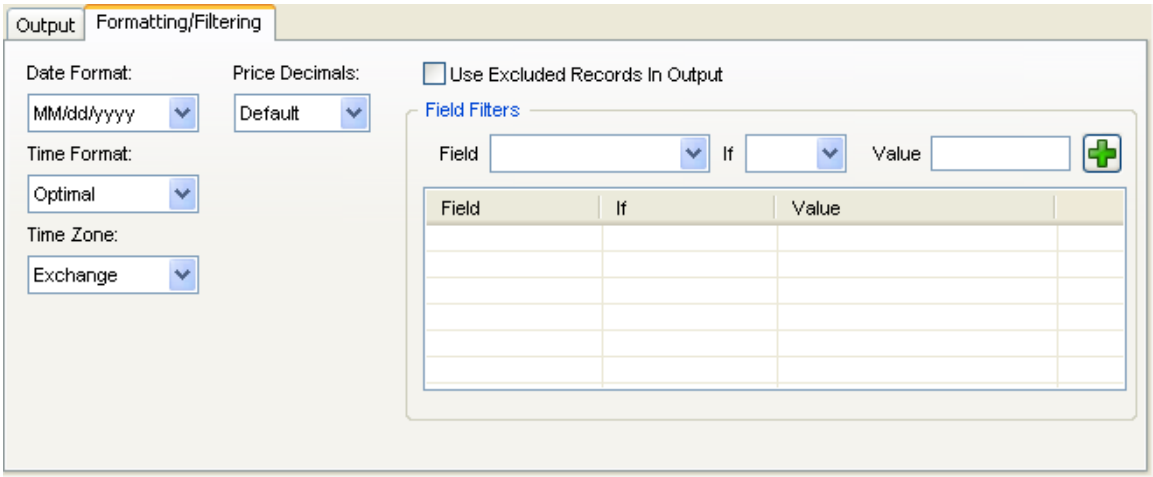
**Output Fields:** Active whether the user selects *Screen* or *File* as the '*Output To'*, here the user can make choices about the fields within the data file. The field delimiter can be chosen here by selecting *Space*, *Tab*, or by entering whatever character you wish to use (comma ',' is the most commonly-used character). Finally, choose the fields you wish to include in the file. The up and down arrows to the right of the *Field Name* list allows users to move fields up and down. The available fields will change depending on the *Interval* and *Exchange* selected. For more information about each field, please see the *File Format Guide* for each exchange's data, which should be included with purchased data but is also available on Tick Data's website: http://www.tickdata.com/support/

**VWAP:** Beginning with Build 20131125, TickWrite can generate a volume-weighted average price (VWAP) for all *Interval* selections in Equity Trade data. This calculation is based on the following formula, using the *Granularity* setting for the period, or if *Trades* is the Interval, it will accumulate over the trading day:

**VWAP = Sum (price * volume) / Total Volume**

**File Header:** You can optionally elect to include a header as the first line in each output file by checking the Include Header checkbox. By default, the header row will include the name of each field, in the specified order, delimited by the specified delimiter. However, if you would like to change the standard header to a custom value, you can do so by clicking the Add Custom Header button entering your own header. This is useful if your internal systems require a certain header or you need to name the output fields differently. Note that the custom header is written exactly as entered; if any changes are made to the field selection the custom header must be changed accordingly.

## Formatting/Filtering Tab:




**Date Format:** Select the desired date format for the output file.

**Price Decimals:** Used to select the desired number of decimal places in the output file. *Default* is set by default, and will use the standard number of decimal contained in the source data (which differs by exchange). The user can also force TickWrite to output a specific number of decimal places by selecting from the list.

**Time Format:** Select the desired time format. Since some data Tick Data offers has a millisecond stamp, while others have only a second stamp or even only a minute stamp, by selecting *Optimal*, TickWrite will use the proper time format. Alternately, the user can choose a specific time format from the list.

**Time Zone:** TickWrite has the ability to output data in various time zones. This is especially helpful when working with data from an exchange that is not in your country, as some countries have different schedules for adjusting for Daylight Savings Time. The three choices are **Exchange Time Zone** (default), **Local Time Zone**, and **GMT**. **Exchange Time Zone** will output the data in the time zone of the exchange on which it is traded. For Indices, this generally means the exchange on which the futures contract is traded. The **Local Time Zone** value is derived from the time zone to which your computer is set. Please be sure your computer's clock is set properly. **GMT** is Greenwich Mean Time, the international baseline time zone. GMT does not adjust for Daylight Savings Time, so depending on the time of the year, the number of hours from one time zone to GMT varies. TickWrite handles this automatically.

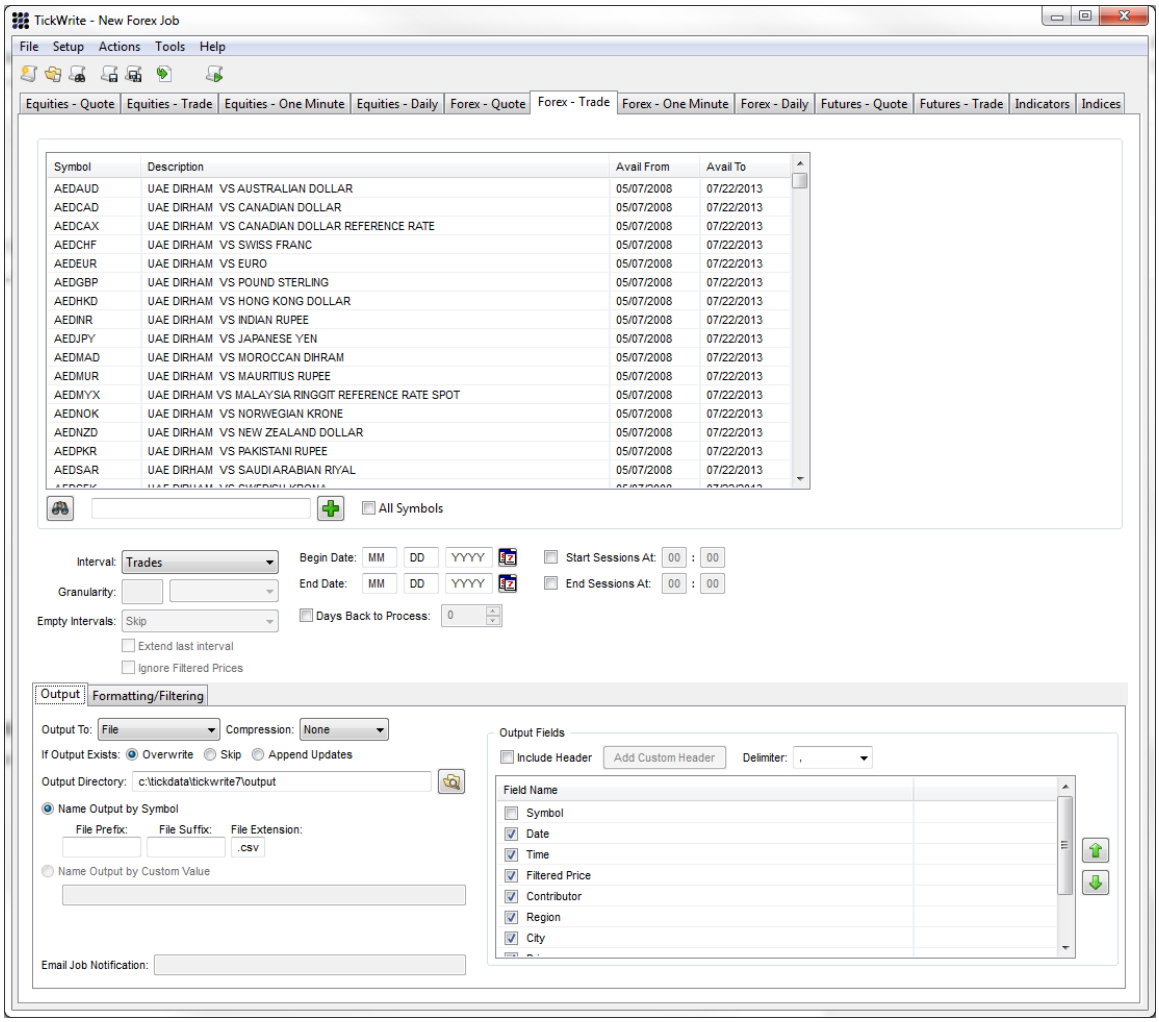
**Use Excluded Records in Output:** A new feature in TickWrite 7.1, this feature allows the user to generate time series in intervals (Time Bars or Tick Bars) that include trades flagged to be excluded. These can include out-of-sequence trades, off-exchange trades, and other trades that have condition codes suggesting they should be excluded from the data. This feature is only available for certain data sets. In cases where it is not available, the checkbox will be disabled.

**Field Filters:** This feature allows users to filter output data and only display data meeting the desired parameters. The fields available for filtering vary based on the *Interval* and *Exchange* selected. Select your filter parameters and click the 'plus' sign. To remove a filter or all filters, right-click in the field display window to show a context menu.

If you wish to filter by two parameters in the same field, separate the Values with commas and use 'IN' and/or 'NOT IN'. For example, if you wanted to only include trades with Exchange Codes 'N' and 'S', you would enter 'Exchange Code' in *Field*, 'IN' in *If*, and 'N,S' in the *Value* field.

## Creating Files of Forex Currency Data

Here is the *Forex – Trade* Job window:



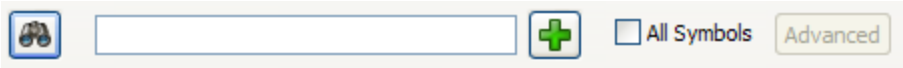

Depending on the data purchased, you may see only one Forex tab titled *Forex* or multiple Forex tabs: *Forex – Quote, Forex – Trade, and Forex – One Minute*. If, for example, you only purchased One-Minute FX Data, you will only see a tab titled *Forex*. Clients receiving Tick Forex Data may also receive one-minute. These will cause both tabs to be displayed.

Each of these Forex tabs accesses different data. Using the *Forex – Trade* tab provides the most versatility for processing trade-only data, and from it a user can create not only tick bars but also interval bars (i.e. one-minute bars), daily bars, weekly bars, and monthly bars. And when processing interval bars using the *Forex – Trade* tab, a user can filter output data using all of the fields of the tick-by-tick file yet write it out to interval or daily/weekly/monthly bars. However since the *Forex – Trade* tab accesses a much larger database of tick-by-tick trade data, any processing performed will take longer. Therefore, if the *Forex – One Minute* tab is available, any processing of data into files of bar intervals should be done from the *Forex – One Minute* tab, as it will perform the job considerably faster.

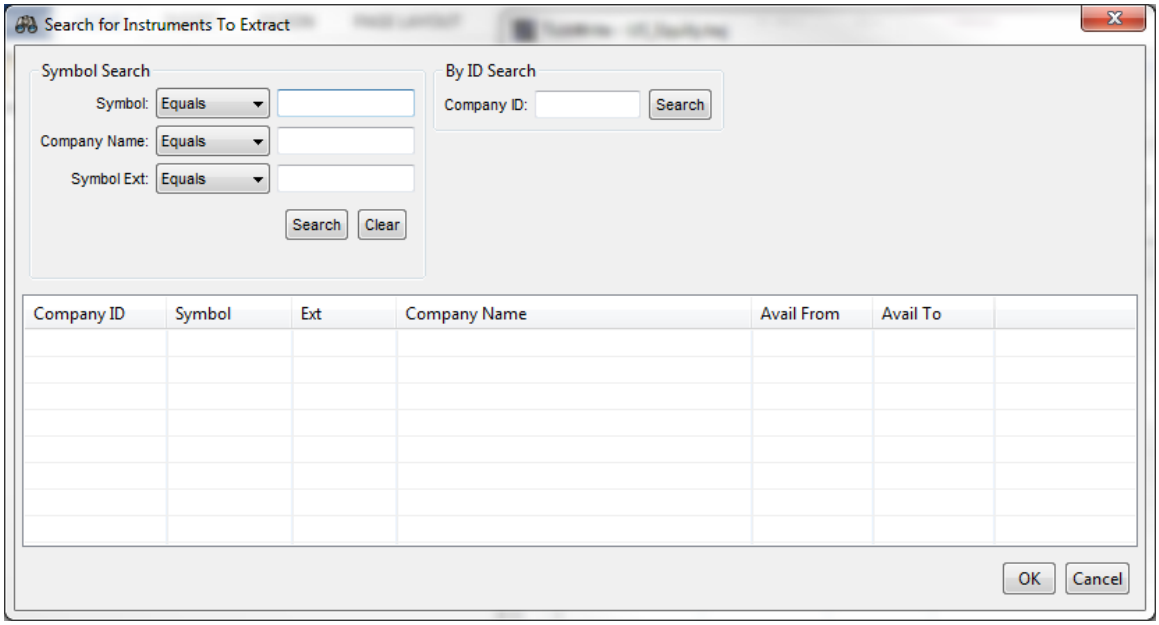
**NOTE: The list of available data will NOT be automatically displayed in the symbol list, as this can represent over two thousand symbols.**

## Adding Symbols to a Job

The user must add symbols to the Job window for processing. Symbols can be added to the symbol list using these buttons and fields:




Click the binoculars to open the *Symbol Search* window:




Select the desired filter parameters and click *Search*. **NOTE: leaving the fields blank and clicking 'Search' will display all available symbols.** The results will appear in the *Instrument Search Results* window. There you can select the symbols you wish to process, and they will appear in the *Symbol Search* window. Individual symbols can be removed if not desired by right-clicking on the symbol in the list and clicking *remove.* Click *OK* to add the symbols to the symbol list in the Job window.

The following are details for each Job window parameter (*Trade* parameters are shown):

### *Interval*

**Quotes:** The output file will contain all ticks for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a quote printed.

**Time Based Bars:** When selected, TickWrite outputs files of any desired intraday time interval from 1-second bars up. Each line of data can contain Date, Time, Open, High, Low, Close, Volume (if available), Tick Count, Up Ticks, Down Ticks, and/or Same Ticks for that interval. In the *Granularity* box, you must specify the length of a bar interval in whole seconds or whole minutes. Adjacent is a field to select MINUTES or SECONDS.

The timestamp for each interval represents the data of the period ending immediately prior to the timestamp. For example, when using 5-minute bars, the 8:35 bar contains data from 8:30:00 to 8:34:59. As another example, when using 30-minute bars, the 4:00 bar contains data from 3:30:00 to 3:59:59.

**Daily/Weekly/Monthly Bars:** These intervals will output files of 1-day, 1-week, or 1-month intervals, respectively.

## *Empty Intervals*

**Skip Empty Intervals**: Any interval without data is excluded from the file. There will not be a timestamp. The only drawback to this method comes if a user is working in a spreadsheet, as there will not be an equal number of prints each day.

**Hold Last Value:** Holds the value of the close of the last bar to have a price through all intervals until another price occurs. This guarantees the number of bars per day is constant, but creates artificial bars.

**Fill With Zeroes:** Any empty interval will have a zero (0) value for the Open, High, Low, Close, and Volume. This also guarantees the number of bars per day is constant, but if it is graphed, the zeroes will cause the chart to be useless.

## *Extend Last Interval*

Active when *Time Based Bars* is selected at the *'Interval'*, this parameter is useful if there are not an even number of intervals in a single day, based on the bar interval the user selected in *Granularity*. For example, the U.S. stock market opens at 9:30 and closes at 16:00 EST. If the user selects '60' for the *Granularity*, there is not an even number of 60-minute bars in the day. If *Extend Last Interval* is not checked, there will be a 16:30 bar that only contains 30 minutes of data (15:30:00-15:59:59). However, if **Extend Last Interval** is checked, the last bar of the day will be a 15:30 bar that contains 90 minutes of data (14:30:00-15:59:59).

## *Begin Date/End Date*

By default, the begin and end dates will both say *MM DD YYYY*. When *MM DD YYYY* is displayed, the complete date ranges for each individual symbol in the list of checked symbols will be used by the corresponding symbol. However, this can be overridden by entering begin and end dates in the appropriate boxes.

The buttons to the right of the *YYYY* field will pull up calendars that can assist users to enter dates.

## *Days Back to Process*

Instead of creating a file with a specific date range, a user may want to look at data only for the past *x* days. This setting is especially useful if such a client subscribes to daily updates, as a file can be updated automatically each night to only reflect trading for the past *x* days.

## *Start Session At/End Session At*

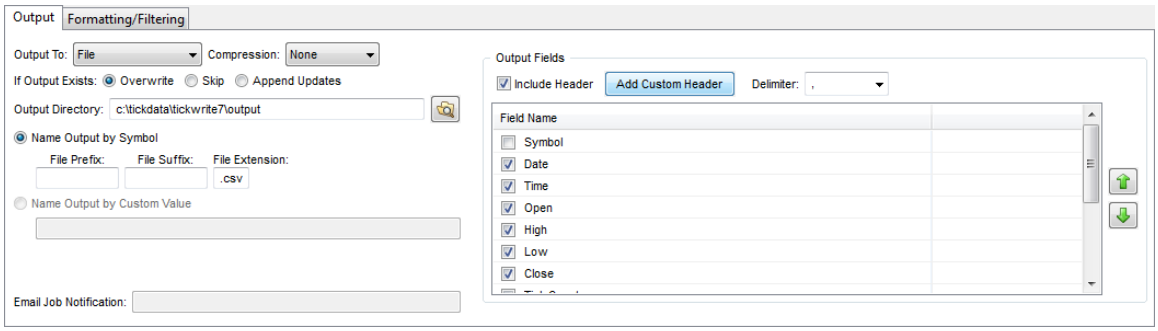
By default, the *Start Sessions At* and *End Sessions At* fields are inactive and display *00:00.* Set this way, TickWrite will write out all of the data for the sessions chosen for each day. If the user selects multiple symbols, the file for each symbol will be written out with the respective session hours of each. However, users can also confine the data for all selected symbols to a particular time range each day.

To activate these fields, check the boxes to the left of the *Start Sessions At* and/or *End Sessions At* fields (you can use either or both). Then enter the desired hours and minutes in 24-hour (military) time. The *End Sessions At* value will act as the close of the day, and the last tick of the session will be the last tick BEFORE the closing time entered.

## *Output and Formatting/Filtering*

The bottom section of the Job window contains two tabs with parameters for output type, file naming, output fields, and formats.

### Output Tab:




**Output To:** Output data to a file or to the screen. If *File* is selected, the user must select the Output parameters on the tab. If *Screen* is selected, all other Output parameters deactivate (except for the *Output Fields* section). Screen output data can be copied in the window (select multiple fields using the *Shift* and *Ctrl* buttons) and pasted into spreadsheets and text editors like **Word** or **Notepad. NOTE: Pasted data will use the *Delimiter* set in *Output Fields*; in order to copy fields into separate cells in a spreadsheet, use *Tab* as the delimiter.**

**Compression:** The user can write out ASCII files that are unzipped (the largest output files) or compressed using *Zip* or *Gzip*.

**If Output Exists:** Determines how TickWrite will handle file creation if a file by the same name already exists in the output directory.

> **Overwrite Existing**: The existing file will be deleted and recreated according to the parameters in the job. The user will not be warned that the existing file will be overwritten.
>
> **Append Updates:** When selected, TickWrite will attempt to append data in an existing file using data generated by the job. This selection should primarily be used by clients who subscribe to daily updates and have jobs scheduled to download and process out the same data every day. It will decrease processing time, as the job will begin where the existing file leaves off.
>
> **Skip:** The extraction job will leave the existing file untouched and not extract new data.

**Output Directory:** Enter the desired location of output files. This must be chosen prior to processing data to a file. As with all parameters, this location can be set as a default by selecting SETUP -> Tab Defaults -> Set Current Values as Default for Tab. **NOTE: As with all defaults, the *Output Directory* set in a tab will only affect that tab.**

**Name Output by Symbol:** Will use the symbol of the instrument as the filename. This parameter also allows users to include a file prefix and/or suffix and select the file extension.

**Name Output by Custom Value:** Allows the user to choose the filename of the output ASCII file. **NOTE: Active only when one symbol is selected.**

**Email Job Notification:** Once you have entered valid SMTP server settings in *Preferences*, enter a valid email address in this field to email notifications of Job success or failure, along with an attached .twj Job file.

**DATE WILDCARDS IN FILE PATHS:** TickWrite7 supports date wildcards that can be used in the output directory, file prefix, file suffix, and custom file name. The wildcards will resolve to the current date and/or time as of when the collection job is first executed. This can be used to dynamically create new directories/files based on the current date without the need to create custom scripts. To utilize a wildcard, it must be denoted ${ and } in the literal value. The following are the supported wildcards:

**yyyy – current year**

**MM – current month**

**dd – current day of month**

**HH – hour of day (0 – 23)**

**mm – minute of hour**

For example, the following output directory might be entered:

**C:\temp\${yyyy-MM-dd}\TRADES**

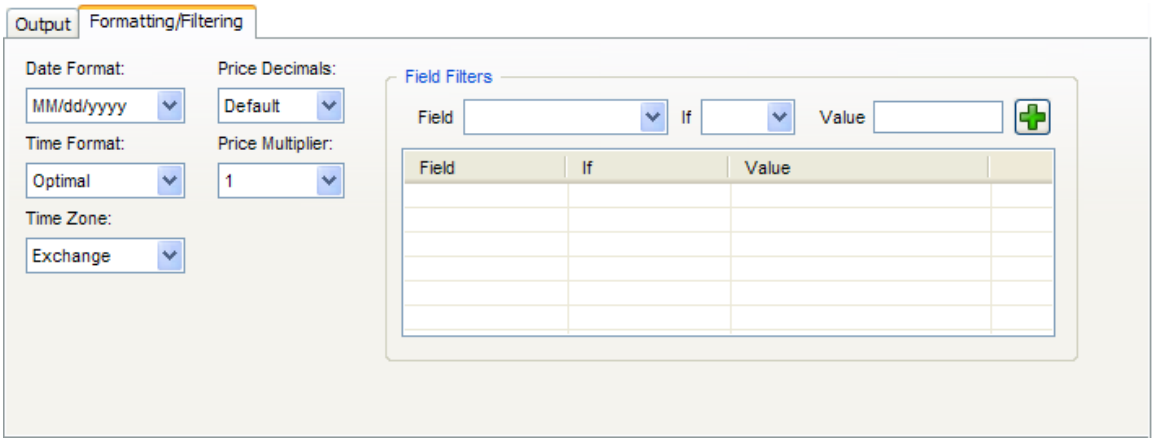
Assuming that today is April 16th, 2010 this would resolve to the following directory name:

**C:\temp\2010-04-16\TRADES**

**Output Fields:** Active whether the user selects *Screen* or *File* as the '*Output To'*, here the user can make choices about the fields within the data file. You can choose whether or not to include a header row that shows the field names at the top of each file. The field delimiter can be chosen here by selecting *Space*, *Tab*, or by entering whatever character you wish to use (comma ',' is the most commonly-used character). Finally, choose the fields you wish to include in the file. The up and down arrows to the right of the *Field Name* list allows users to move fields up and down. **NOTE: Rearranging the field order will slow down file creation speed.**

**File Header:** You can optionally elect to include a header as the first line in each output file by checking the Include Header checkbox. By default, the header row will include the name of each field, in the specified order, delimited by the specified delimiter. However, if you would like to change the standard header to a custom value, you can do so by clicking the Add Custom Header button entering your own header. This is useful if your internal systems require a certain header or you need to name the output fields differently. Note that the custom header is written exactly as entered; if any changes are made to the field selection the custom header must be changed accordingly.

## Formatting/Filtering Tab:




**Date Format:** Select the desired date format for the output file.

**Price Decimals:** Used to select the desired number of decimal places in the output file. *Default* is set by default, and will use the standard number of decimal places required for the contract. The user can also force TickWrite to output a specific number of decimal places by selecting from the list.

**Time Format:** Select the desired time format. Since some data Tick Data offers has a millisecond stamp, while others have only a second stamp or even only a minute stamp, by selecting *Optimal*, TickWrite will use the proper time format. Alternately, the user can choose a specific time format from the list.

**Price Multiplier:** Activated when checked, this parameter allows users to factor in a multiplier to the entire output file. This multiplier must be a factor of 10, but can be a decimal (i.e. .001, .1, 10, 100, etc.).

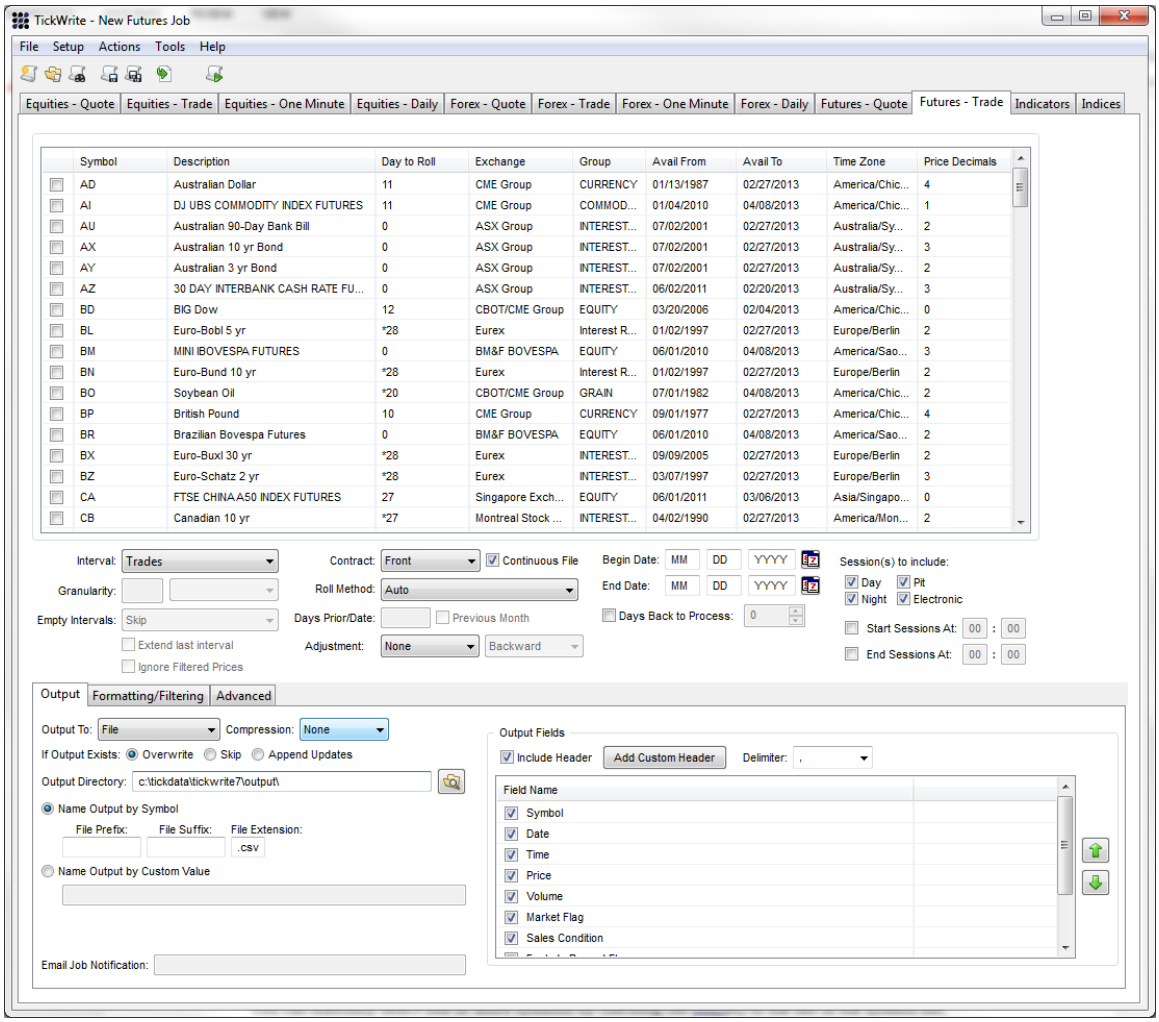
**Time Zone:** TickWrite has the ability to output data in various time zones. This is especially helpful when working with data from an exchange that is not in your country, as some countries have different schedules for adjusting for Daylight Savings Time. The three choices are **Exchange Time Zone** (default), **Local Time Zone**, and **GMT**. **Exchange Time Zone** will output the data in the time zone of the exchange on which it is traded. For Indices, this generally means the exchange on which the futures contract is traded. One notable exception is the DJIA cash index data, which is in Eastern Standard Time even though the DJ futures contract is traded in CST on the CBOT. The **Local Time Zone** value is derived from the time zone to which your computer is set. Please be sure your computer's clock is set properly. **GMT** is Greenwich Mean Time, the international baseline time zone. GMT does not adjust for Daylight Savings Time, so depending on the time of the year, the number of hours from one time zone to GMT varies. TickWrite handles this automatically.

**Field Filters:** This feature allows users to filter output data and only display data meeting the desired parameters. The fields available for filtering vary based on whether the user is on the Trade, Quote, or One-Minute tab. Select your filter parameters and click the 'plus' sign. To remove a filter or all filters, right-click in the field display window to show a context menu.

If you wish to filter by two parameters in the same field, separate the Values with commas and use 'IN' and/or 'NOT IN'. For example, if you wanted to only include trades with Exchange Codes 'N' and 'S', you would enter 'Exchange Code' in *Field*, 'IN' in *If*, and 'N,S' in the *Value* field.

## Creating Files of Futures Data

Here is the *Futures – Trade* Job window:




Your available futures symbols and date ranges will appear in the data list at the top of the window. You can manually select one or more symbols by checking the box(es) to the left of the symbol list.

Right-click anywhere in the symbol list to activate a popup menu with the option to check all symbols, un-check all symbols, or invert selection. To check many symbols at once, you can import a list of symbols. Simply list your desired symbols in a text file, one per line, and save it as a *'.txt'*, *'.csv'*, or *'.asc'* file. Click Actions -> Import Symbol List, and browse to select your saved file. When OPEN is clicked, the symbols in the file will be checked in the data list. Please note that any symbols that were checked prior to importing a list will be unchecked (unless they are also on the list).

The screen will activate different settings depending on: 1) how many symbols are selected; 2) the *Granularity* selected; 3) the *Output To* selected, and; 4) which *Contract* is selected.

If only **one** symbol is selected, you have the option to create a file containing a single contract, to write out all contracts individually at once, or to create a continuous file.

If **more than one** symbol is selected, you have the option to write out all contracts individually at once or to create a continuous file, but not to create files containing a single contract.

The following are details for each Job window parameter:

### *Interval*

**NOTE: Please see the *Futures File Format Guide* available at www.tickdata.com for a detailed explanation of available fields.)**

**Trades:** The output file will contain all ticks for the selected time period and symbol(s). Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a trade occurred. Users will also note that there is no way to output 'Tick Count' when ***Trades*** is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1.

**Quotes (only available under the *Futures – Quote* tab):** The output file will contain all Level I quotes (top of book or best bid/offer- BBO) for the selected time period and symbol(s). **Quote data is much larger in volume and size than Trade data, and therefore processing times will be considerably longer.**

**Tick Based Bars:** Users can also write data out as multi-tick bars for futures trade and quote data. When ***Tick Based Bars*** is selected, users can define the number of ticks that will comprise each bar, instead of using a time interval to constrain a bar. In the *Granularity* box, you must specify the number of ticks per bar. Each line of data in the output file is time-stamped with the time of the last tick in each bar.

**Time Based Bars:** When selected, TickWrite outputs files of any desired intraday time interval from 1-second bars up for trade data and from 1-minute bars up for quote data. Each line of data can contain Date, Time, Open, High, Low, Close, Volume (if available), Tick Count, Up Ticks, Down Ticks, and/or Same Ticks for that interval. In the *Granularity* box, you must specify the length of a bar interval in whole seconds or whole minutes. Adjacent is a field to select MINUTES or SECONDS.

The timestamp for each interval represents the data of the period ending immediately prior to the timestamp. For example, when using 5-minute bars, the 8:35 bar contains data from 8:30:00 to 8:34:59. As another example, when using 30-minute bars, the 4:00 bar contains data from 3:30:00 to 3:59:59.

**Daily/Weekly/Monthly Bars:** These intervals will output files of 1-day, 1-week, or 1-month intervals, respectively.

## *Empty Intervals*

These selections are not active when **Quotes, Trades,** or **Tick Based Bars** are selected as the *Interval*. For all other intervals, they give important options for handling empty time intervals. Empty intervals occur when there are no trades during the full length of a bar.

**Skip Empty Intervals**: Any interval without data is excluded from the file. There will not be a timestamp. The only drawback to this method comes if a user is working in a spreadsheet, as there will not be an equal number of prints each day.

**Hold Last Value:** Holds the value of the close of the last bar to have a price through all intervals until another price occurs. This guarantees the number of bars per day is constant, but creates artificial bars.

**Fill With Zeroes:** Any empty interval will have a zero (0) value for the Open, High, Low, Close, and Volume. This also guarantees the number of bars per day is constant, but if it is graphed, the zeroes will cause the chart to be useless.

## *Extend Last Interval*

Active when **Time Based Bars** is selected at the *'Interval'*, this parameter is useful if there are not an even number of intervals in a single day, based on the bar interval the user selected in *Granularity*. For example, if the SP opens at 8:30 and closes at 15:15, and the user selects '30' for the *Granularity*, there are not an even number of 30-minute bars in the day. If *Extend Last*

*Interval* is not checked, there will be a 15:30 bar that only contains 15 minutes of data (15:00:00-15:14:59). However, if *Extend Last Interval* is checked, the last bar of the day will be a 15:00 bar that contains 45 minutes of data (14:30:00-15:14:59).

## *Ignore Filtered Prices*

Active when creating **Tick** or **Time Based Bars** from *Tick Trade data*, this parameter allows the user to generate bars using raw, unfiltered prices. If unchecked, bars are built using prices that may be altered by Tick Data's proprietary price filtering algorithm. **NOTE: Also see section on *Formatting/Filtering* tab for information on 'Use Excluded Records in Output' parameter.**

## *Contract*

**Front:** Will process all of the nearest contracts in a given date range into a single continuous contract. To create a continuous file, check the '*Continuous File'* box, and give the file a name in the '*File Name'* field. If '*Continuous File*' is not selected, the most active months of each contract within the date range will be processed into separate files. In this case, the files will be automatically named: CCMYY.ext, where CC is the Ticker symbol, M is the month code for the expiration month, YY is the expiration year, and .ext is the selected file extension. If *'Continuous File'* is selected and only one symbol is selected, you have the option of naming by *Symbol* or by *Custom Value*. If *'Continuous File'* is selected and multiple symbols are selected, TickWrite will name the files by *Symbol*. (For more details see the sections below: ***Continuous Files)***

**1st Back:** Will process in the same manner as **Front**, but instead of using the nearest contract, it will use the *first back month* as the current contract.

**2nd Back:** Will process in the same manner as **Front**, but instead of using the nearest contract, it will use the *second back month* as the current contract.

**3rd Back:** Will process in the same manner as **Front**, but instead of using the nearest contract, it will use the *third back month* as the current contract.

**Most Active:** Will process in the same manner as **Front**, but instead of using the nearest contract, it will attempt to use the most liquid contract as the current contract. This can be useful under conditions. For example, for certain instruments the Front Month is the most liquid. For other instruments the First Back might be the most liquid. For still other instruments, the Front Month might *usually* be the most liquid but a contract or two per year are illiquid and should be skipped. By selecting **Most Active** all three of these examples can be extracted as part of the same job.

**All:** Will process all contract months available in the given date range into separate files. They will be automatically named using the CCMYY.ext format.

**Individual Contract Months:** If only one symbol is checked, you can process one contract at a time. A list of available contracts will appear in the drop-down box. Once the contract month is selected, the date range for that specific contract month will appear in the *'Begin Date'* and *'End Date'*. If a begin date from prior to the available range of the contract is manually selected, the data will begin at the contract's inception. **The list of contracts will not appear if more than one symbol is checked.**

## *Continuous Files*

Most futures contracts do not stay active for more than a few months. This can make system development and optimization very time-consuming. The solution is to perform research on files that contain multiple contracts linked together, using only the most active portion of each contract. TickWrite makes it easy to create continuous files of futures data. Selecting **Front**,

**1st Back**, **2nd Back**, **or 3rd Back** under *Contract* will activate the ***Roll Method, Day To Roll, and Adjustment Type*** options. Here, users can choose a roll method and adjustment type.

**Roll Method:**

**Auto:** *AutoRoll* is the recommended roll method, because it is the most precise way to determine the best time to roll. *AutoRoll* computes daily tick volume for the current and next back-month contracts (regardless of the interval selected) and rolls to the next contract when the daily, day-session tick volume of the back-month contract exceeds the daily tick volume of the current month contract. By constraining this computation to a specific range of dates (based on Tick Data's research), *AutoRoll* can be applied to virtually all futures symbols.

**Expiration:** This method will roll the contract on the expiration day. It is useful for several commodities that actually trade up through their last trading days (i.e. CF, NK, NG).

**Days Prior to Expiration:** This method works similarly to '*Expiration*', except that the user has the option of entering a positive integer into the *Days Prior/Date* box (just below the '*Roll Method*' field), causing the roll to occur *n* days prior to expiration. Using a value of *1* will cause the roll to occur one day prior to expiration.

**Date:** TickWrite can also use a specific date as the criteria for rollover. When '*Date*' is set as the *Roll Method*, the *Days Prior/Date* box will activate. If only one symbol is selected, the field will be populated with the date Tick Data suggests. This value can be changed by the user, although it will revert back to the default date when the program is restarted or the symbol selection is changed (a custom value can be saved as part of a *Job*). If multiple symbols are selected, the field will be blank, and the number entered will be used as the roll day for all selected symbols. If symbols with different roll dates are selected, it is advised to create a separate job for each and run the jobs from the *Job Explorer.*

Next to the *Days Prior/Date* box is a checkbox for *Previous Month.* If *Previous Month* is unchecked, the number in *Day To Roll* represents a date in the expiration month (i.e. '12' in *Day To Roll* is the 12th of the expiration month). If *Previous Month* is checked, the number in *Day To Roll* represents a date in the month prior to the expiration month (i.e. '12' in *Day To Roll* is the 12th of the previous month). If the roll day ever falls on a non-trading day, TickWrite will use the first trading day after the date as the roll day. **NOTE: This differs from the method in TickWrite 6.**

**Inception:** This method rolls to the next contract on the first trading date of the newest contract. It is used for Japanese symbols JA, JM, and JG. It will only work for the *Contract*- FRONT setting. Choosing it for other settings will result in an error.

**Adjustment:**

This parameter has changed significantly in TickWrite 7.1, with addition of *Ratio* adjusting. *Ratio* adjustment removes rollover gaps by dividing the price of the current front month by the price of the next front month contract at the close of the day session on the day prior to the rollover. If *Forward* is selected, that quotient is then multiplied by all subsequent prices in the series. If *Backward* is selected, the inverse of that quotient is multiplied by all previous prices in the series. This calculation is repeated at every rollover.

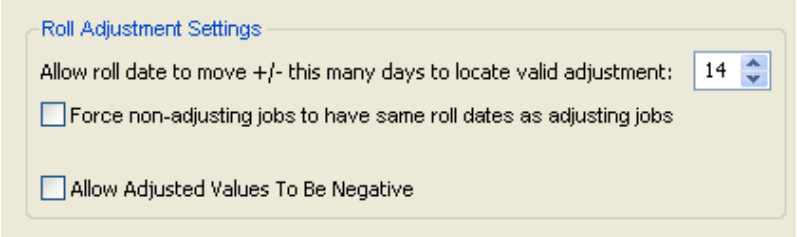
Tick Data used to only support a simple arithmetical adjustment which subtracts one closing price from the other, which we now call *Difference* adjusting. In *Difference* adjusting, the difference is added to all previous prices (if *Backward* adjusting) or subtracted from all subsequent prices (if *Forward adjusting)*.

If *None* is selected, no price adjustment is made, and any price gaps that appear as a result of rolling contracts remain.

Much has been written in the world of Futures about roll adjustment methodologies. Some claim that one is better than the other. What is most important is that the user has a complete understanding of the mathematics behind his/her model and uses the adjustment method (or no method) that produces compatible data.

### *Global Settings Impacting Continuous Contracts*

Certain global settings also have an impact on the generation of continuous contracts. To configure these settings, go to SETUP -> Preferences -> FUTURES PREFERENCES.




As described above, adjustment factors are determined using the prices on the day prior to the roll. Occasionally, for certain illiquid contracts, a roll date is determined to be a certain day but the data on the prior day is unavailable or insufficient to calculate an appropriate adjustment factor. The following two settings impact the behavior of an extraction when this condition exists:

**Allow roll date to move +/- this many days to locate valid adjustment –** When the condition described above occurs, the system will move the roll date in order to locate a valid adjustment factor (the roll date will always be moved forward except in cases where a Front Month Expiration roll is used, in which case it is moved backward). This setting determines how many days a roll date can be moved to find a valid adjustment factor. If an adjustment factor cannot be determined after moving the roll date this number of days, the extraction job will fail for this contract.

**Force non-adjusting jobs to have same roll dates as adjusting jobs –** This setting will only effect jobs where the Adjustment Type is set to "None" (i.e. non-adjusting jobs). For jobs that do not adjust, the ability to determine an adjustment factor is irrelevant, so the above condition is not a problem. However, this means that it is possible for a non-adjusting job to have different roll dates than the same job file with adjustments. This discrepancy may be undesirable, in which case the user can check this option which will force any non-adjusting jobs to have the same roll dates as the same job with adjustments. In other words, the system will potentially move the roll date in order to calculate an adjustment factor even though that adjustment factor will not be applied.

**Allow Adjusted Values To Be Negative:** Sometimes, applying adjustments to prices will cause those prices to become negative. Trading models are generally not capable of handling negative prices, so by default TickWrite 7 will add a constant to ALL PRICES in the file to bring the negative prices positive (even values in the most recent contract in a *backwards-adjusted* file will be adjusted). Checking this box will override this feature and allow for negative prices in the output file.

## *Begin Date/End Date*

By default, the begin and end dates will both say *MM DD YYYY*. When *MM DD YYYY* is displayed, the complete date ranges for each individual symbol in the list of checked symbols will be used

by the corresponding symbol. However, this can be overridden by entering begin and end dates in the appropriate boxes.

The buttons to the right of the *YYYY* field will pull up calendars that can assist users to enter dates.

### *Days Back to Process*

Instead of creating a file with a specific date range, a user may want to look at data only for the past *x* days. This setting is especially useful if such a client subscribes to daily updates, as a file can be updated automatically each night to only reflect trading for the past *x* days.

### *Start Session At/End Session At*

By default, the *Start Sessions At* and *End Sessions At* fields are inactive and display *00:00.* Set this way, TickWrite will write out all of the data for the sessions chosen for each day. If the user selects multiple symbols, the file for each symbol will be written out with the respective session hours of each. However, users can also confine the data for all selected symbols to a particular time range each day.

To activate these fields, check the boxes to the left of the *Start Sessions At* and/or *End Sessions At* fields (you can use either or both). Then enter the desired hours and minutes in 24-hour (military) time. The *End Sessions At* value will act as the close of the day, and the last tick of the session will be the last tick BEFORE the closing time entered. **NOTE: Using *Start Sessions At* and/or *End Sessions At* will deactivate the *Day* and *Night* checkboxes under *Session(s) to Include*, as the times entered will override Day/Night session settings.**

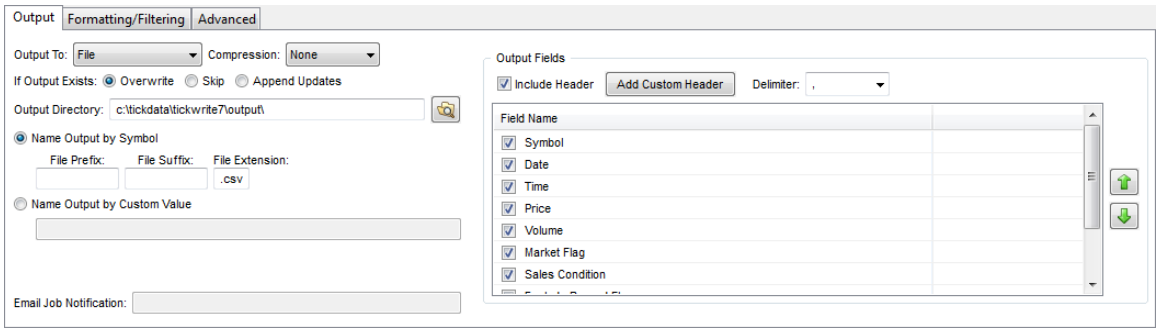
### *Session(s) to Include*

Tick Data provides data for trading in both pit and electronic markets for night sessions and day sessions since 1 July 2003 (prior to that date we only have limited night session data for GLOBEX contracts such as ES and NQ, and day-session only for all other contracts). Currently, and for the foreseeable future, all overnight trading is done via electronic markets. However, several commodities also have electronic trading during the day session, concurrent with the pit session. While most exchanges have separate symbols for these markets, Tick Data has integrated these sessions into a single symbol, and TickWrite gives users the ability to write out data for pit and/or electronic trading during the day and/or night sessions all in one file or into separate files. Users simply need to check the appropriate boxes.

### *Output, Formatting/Filtering, and Advanced*

The bottom section of the Job window contains two tabs with parameters for output type, file naming, output fields, and formats.

#### Output Tab:



**Output To:** Output data to a file or to the screen. If *File* is selected, the user must select the Output parameters on the tab. If *Screen* is selected, all other Output parameters deactivate (except for the *Output Fields* section). Screen output data can be copied in the window (select multiple fields using the *Shift* and *Ctrl* buttons) and pasted into spreadsheets and text editors like **Word** or **Notepad. NOTE: Pasted data will use the *Delimiter* set in *Output Fields*; in order to copy fields into separate cells in a spreadsheet, use *Tab* as the delimiter.**

**Compression:** The user can write out ASCII files that are unzipped (the largest output files) or compressed using *Zip* or *Gzip*.

**If Output Exists:** Determines how TickWrite will handle file creation if a file by the same name already exists in the output directory.

> **Overwrite Existing**: The existing file will be deleted and recreated according to the parameters in the job. The user will not be warned that the existing file will be overwritten.
>
> **Append Updates:** When selected, TickWrite will attempt to append data in an existing file using data generated by the job. This selection should primarily be used by clients who subscribe to daily updates and have jobs scheduled to download and process out the same data every day. It will decrease processing time, as the job will begin where the existing file leaves off.
>
> **Skip:** The extraction job will leave the existing file untouched and not extract new data.

**Output Directory:** Enter the desired location of output files. This must be chosen prior to processing data to a file. As with all parameters, this location can be set as a default by selecting SETUP -> Tab Defaults -> Set Current Values as Default for Tab. **NOTE: As with all defaults, the *Output Directory* set in a tab will only affect that tab.**

**Name Output by Symbol:** Will use the symbol of the instrument as the filename. This parameter also allows users to include a file prefix and/or suffix and select the file extension.

**Name Output by Custom Value:** Allows the user to choose the filename of the output ASCII file. **NOTE: Active only when one symbol is selected, and when *Front, 1st Back, 2nd Back, or 3rd Back, or Most Active is* selected as the '*Contract*' while *Continuous File* is checked.**

**Email Job Notification:** Once you have entered valid SMTP server settings in *Preferences*, enter a valid email address in this field to email notifications of Job success or failure, along with an attached .twj Job file.

**DATE WILDCARDS IN FILE PATHS:** TickWrite7 supports date wildcards that can be used in the output directory, file prefix, file suffix, and custom file name. The wildcards will resolve to the current date and/or time as of when the collection job is first executed. This can be used to dynamically create new directories/files based on the current date without the need to create custom scripts. To utilize a wildcard, it must be denoted by ${ and } in the literal value. The following are the supported wildcards:

> **yyyy – current year**
>
> **MM – current month**
>
> **dd – current day of month**
>
> **HH – hour of day (0 – 23)**
>
> **mm – minute of hour**

For example, the following output directory might be entered:

**C:\temp\${yyyy-MM-dd}\TRADES**

Assuming that today is April 16th, 2010 this would resolve to the following directory name:

**C:\temp\2010-04-16\TRADES**

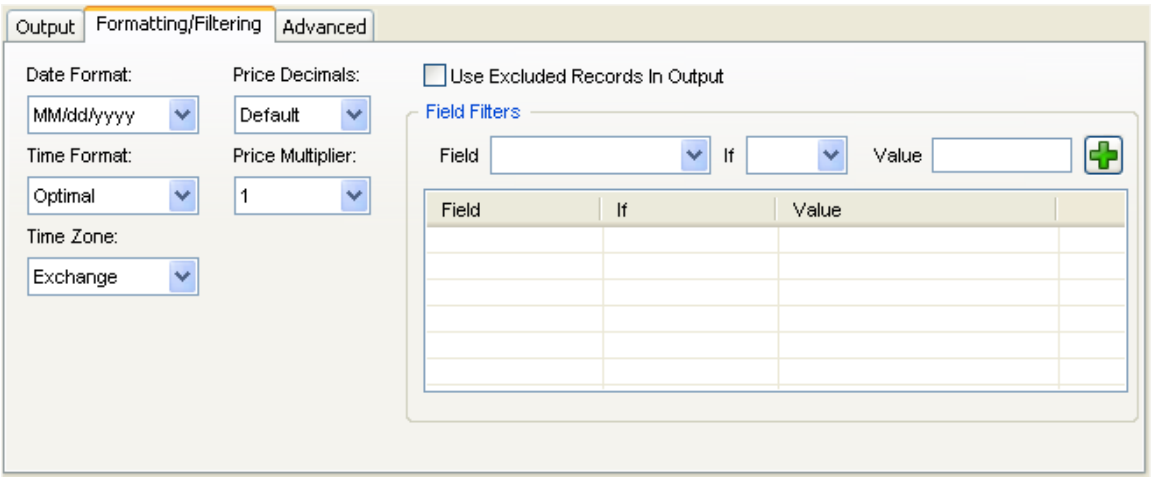
**Output Fields:** Here the user can make choices about the fields within the data file. The field delimiter can be chosen here by selecting *Space*, *Tab*, or by entering whatever character you wish to use (comma ',' is the most commonly-used character). Finally, choose the fields you wish to include in the file. The up and down arrows to the right of the *Field Name* list allows users to move fields up and down.

**File Header:** You can optionally elect to include a header as the first line in each output file by checking the Include Header checkbox. By default, the header row will include the name of each field, in the specified order, delimited by the specified delimiter. However, if you would like to change the standard header to a custom value, you can do so by clicking the Add Custom Header button entering your own header. This is useful if your internal systems require a certain header or you need to name the output fields differently. Note that the custom header is written exactly as entered; if any changes are made to the field selection the custom header must be changed accordingly.

**VWAP:** Beginning with Build 20131125c, TickWrite can generate a volume-weighted average price (VWAP) for all *Interval* selections in Futures Trade data. This calculation is based on the following formula, using the *Granularity* setting for the period, or if *Trades* is the Interval, it will accumulate over the trading day:

**VWAP = Sum (price * volume) / Total Volume**

## Formatting/Filtering Tab:




**Date Format:** Select the desired date format for the output file.

**Price Decimals:** Used to select the desired number of decimal places in the output file. *Default* is set by default, and will use the standard number of decimal places required for the contract. The user can also force TickWrite to output a specific number of decimal places by selecting from the list.

**Time Format:** Select the desired time format. Since some data Tick Data offers has a millisecond stamp, while others have only a second stamp or even only a minute stamp, by selecting *Optimal*, TickWrite will use the proper time format. Alternately, the user can choose a specific time format from the list.

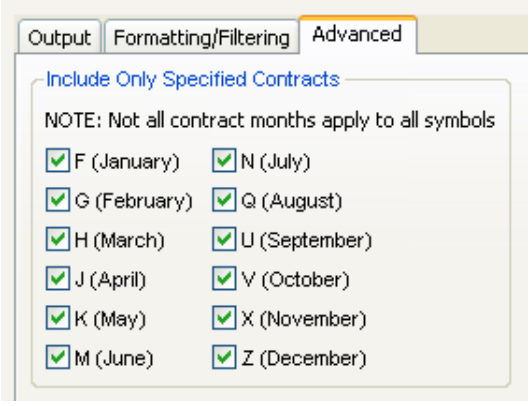
**Price Multiplier:** Activated when checked, this parameter allows users to factor in a multiplier to the entire output file. This multiplier must be a factor of 10, but can be a decimal (i.e. .001, .1, 10, 100, etc.).

**Time Zone:** TickWrite has the ability to output data in various time zones. This is especially helpful when working with data from an exchange that is not in your country, as some countries have different schedules for adjusting for Daylight Savings Time. The three choices are **Exchange Time Zone** (default), **Local Time Zone**, and **GMT**. **Exchange Time Zone** will output the data in the time zone of the exchange on which it is traded. For Indices, this generally means the exchange on which the futures contract is traded. One notable exception is the DJIA cash index data, which is in Eastern Standard Time even though the DJ futures contract is traded in CST on the CBOT. The **Local Time Zone** value is derived from the time zone to which your computer is set. Please be sure your computer's clock is set properly. **GMT** is Greenwich Mean Time, the international baseline time zone. GMT does not adjust for Daylight Savings Time, so depending on the time of the year, the number of hours from one time zone to GMT varies. TickWrite handles this automatically.

**Use Excluded Records in Output:** A new feature in TickWrite 7.1, this feature allows the user to generate time series in intervals (Time Bars or Tick Bars) that include trades flagged to be excluded. These can include out-of-sequence trades, off-exchange trades, and other trades that have condition codes suggesting they should be excluded from the data. **NOTE: This parameter not available in *Futures – Quote* window.**

**Field Filters:** This feature allows users to filter output data and only display data meeting the desired parameters. For futures data, you can filter based on price and volume. Select your filter parameters and click the 'plus' sign. To remove a filter or all filters, right-click in the field display window to show a context menu.

## Advanced Tab:

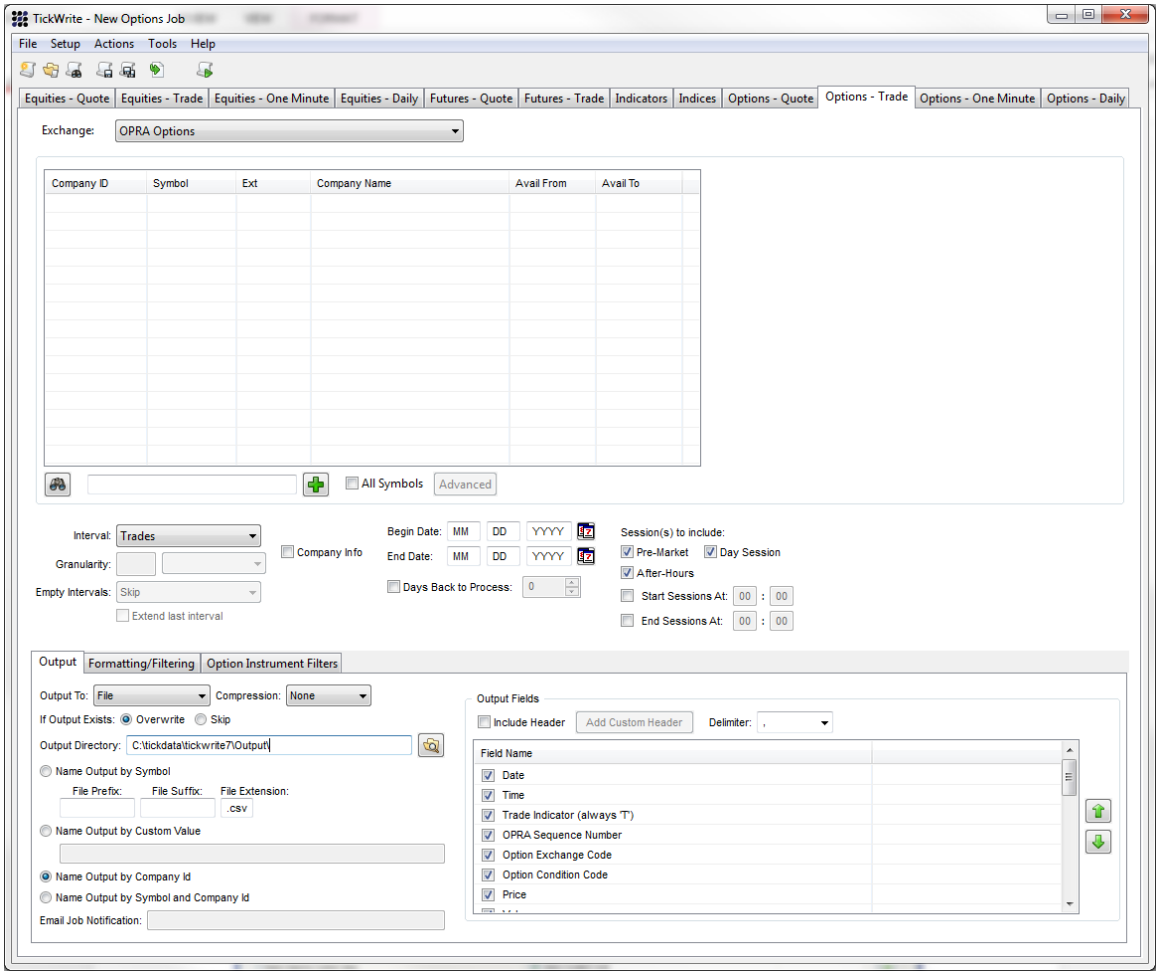



An advanced feature designed to support the generation of continuous contracts is the ability to only consider certain contract months. By default, TickWrite will consider ALL contract months of a particular instrument (although using the Most Active feature may suppress illiquid contracts). However, if a user is certain that they want to disregard certain contract months in their extraction, they can uncheck any contract months that they want to exclude.

**NOTE: This window always includes all contract months (January – December) and does not change based on the instrument(s) selected. Therefore, the selected instrument(s) may not trade in all contract months listed. If a futures contract only trades on the quarterly HMUZ cycle, any checked contract months that are not valid for the instrument are ignored. However, if none of the selected contract months are valid for a selected instrument, TickWrite will not output any data.**

## Creating Files of Options Data

Once your data has been installed, select an **Options** tab. Here is the *Options – Quote* Job window:




Depending on the data purchased, you may see only one options tab titled *Options* or multiple options tabs: *Options – Quote, Options – Trade, and Options – One Minute*. If, for example, you only purchased One-Minute Options Data, you will only see a tab titled *Options*. Clients receiving Tick Options Data may also receive one-minute. These will cause both tabs to be displayed.

Each of these options tabs accesses different data. Using the *Options – Trade* tab provides the most versatility for processing trade-only data, and from it a user can create not only tick bars but also interval bars (i.e. one-minute bars), daily bars, weekly bars, and monthly bars. And when processing interval bars using the *Options – Trade* tab, a user can filter output data using all of the fields of the tick-by-tick file yet write it out to interval or daily/weekly/monthly bars. However since the *Options – Trade* tab accesses a much larger database of tick-by-tick trade data, any processing performed will take longer. Therefore, if the *Options – One Minute* tab is available, any processing of data into files of bar intervals should be done from the *Options – One Minute* tab, as it will perform the job considerably faster.

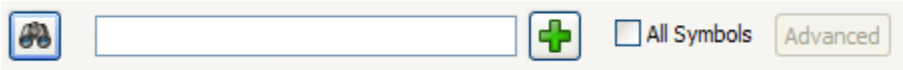
If Trade and Quote data is available on the user's account, the *Options – Quote* tab will be present. From this tab, the only *Interval* available is 'Trades and Quotes'. The output data will have both Trade and Quote data interleafed in the same file, as provided by the exchanges.

Once a tab has been selected, you must choose the *Exchange* from which you wish to process data. Again, only the exchanges for which you purchased data will be available in the list. Once selected, the

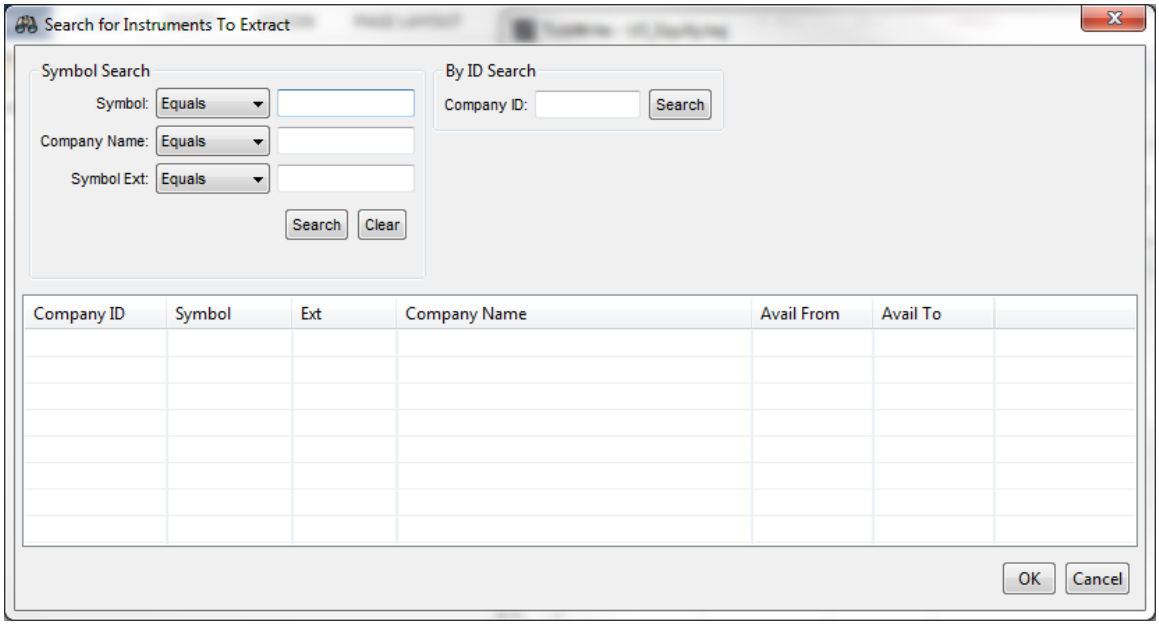
list of available data will NOT be automatically displayed in the symbol list, as this can represent many thousand symbols. **NOTE: At this time, Tick Data only has U.S.-listed Options data, and all U.S. exchanges are contained in the *OPRA Options* Exchange.**

## Adding Symbols to a Job

The user must add symbols to the Job window for processing. Symbols can be added to the symbol list using these buttons and fields:



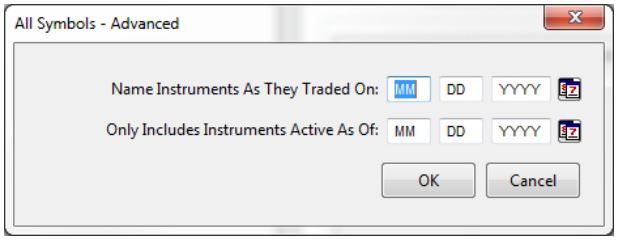

Click the binoculars to open the *Symbol Search* window:




Select the desired filter parameters and click *Search*. **NOTE: leaving the fields blank and clicking 'Search' will display all available symbols.** The results will appear in the *Instrument Search Results* window. There you can select the symbols you wish to process, and they will appear in the *Symbol Search* window. Individual symbols can be removed if not desired by right-clicking on the symbol in the list and clicking *remove.* Click *OK* to add the symbols to the symbol list in the Job window.

Another way to add symbols is to type a symbol or Company ID into the quick add box (to the right of the binoculars) and click the *plus* button.

To include all available symbols in a processing job, check the *All Symbols* box. This will activate the *Advanced* button, which offers additional parameters for processing all symbols:




**Name Instruments As They Traded On:** Leaving this blank will use the current symbols for all companies regardless of the date range selected in the Job window. Selecting a date will use the

symbology as of that date. For example, if you are working with symbols that you know to be a few years old (that may have different symbols today), you might enter a date as of a few years ago in this field so that the symbol naming convention used by TickWrite more closely matches the symbology that you are familiar with.

**Only Includes Instruments Active As Of:** Leaving this blank will result in all active and inactive symbols being included in the processing job (for the date range specified in the processing job). If you select a date, TickWrite will only process symbols that are listed on that date. For example, you may want to extract all symbols from 1995 – 2000 but include only those companies that are still trading today. In this case you would enter today's date in this field.

To check many symbols at once, you can import a list of symbols. Simply list your desired symbols in a text file, one per line, and save it as a *'.txt', '.csv',* or *'.asc'* file. Click FILE -> Import Symbol List, and browse to select your saved file. When OPEN is clicked, the symbols in the file will be checked in the data list. See section *Import Symbol List* in the *First Use* section) **NOTE: Any symbols that were listed prior to importing a list will be removed (unless they are also on the list).**

## Selecting Job Parameters

Once you have selected the desired options symbols for processing, select the parameters in the middle of the window to suit your requirements. The screen will activate different settings depending on: 1) how many symbols are selected; 2) the *Granularity* selected, and; 3) the *Output To* selected.

The following are details for each Job window parameter:

### *Interval*

**Trades:** The output file will contain all trades tick-by-tick for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a trade occurred. Users will also note that there is no way to output 'Tick Count' when ***Trades*** is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1. **NOTE: This *Interval* setting is not available on the *Options – One Minute* tab.**

**Tick Based Bars:** Users can also write data out as multi-tick bars. When ***Tick Based Bars*** is selected, users can define the number of ticks that will comprise each bar, instead of using a time interval to constrain a bar. In the *Granularity* box, you must specify the number of ticks per bar. Each line of data in the output file is time-stamped with the time of the last tick in each bar.

**Time Based Bars:** When selected, TickWrite outputs files of any desired intraday time interval from 1-second bars up. **NOTE: This is trade data only, as TickWrite 7 cannot write out time based bars of quote data. Each line of data can contain Date, Time, Open, High, Low, Close, Volume (if available), Tick Count, Up Ticks, Down Ticks, and/or Same Ticks for that interval. In the *Granularity* box, you must specify the length of a bar interval in whole seconds or whole minutes. Adjacent is a field to select MINUTES or SECONDS.**

The timestamp for each interval represents the data of the period ending immediately prior to the timestamp. For example, when using 5-minute bars, the 8:35 bar contains data from 8:30:00 to 8:34:59. As another example, when using 30-minute bars, the 4:00 bar contains data from 3:30:00 to 3:59:59.

**Daily/Weekly/Monthly Bars:** These intervals will output files of 1-day, 1-week, or 1-month intervals, respectively.

**Trades and Quotes:** Unlike equity data sets, option data files contain trades and quote interleaved together. While Tick Data makes a trade only data set available (using interval of Trades as described above), there is no "quote only" data set (however, users may extract quotes only by applying a field filter on the record type field). By default, the output file will contain all trades and quotes (Level I bids and offers) interleaved for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price

at which a trade occurred. Users will also note that there is no way to output 'Tick Count' when *Trades and Quotes* is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1. **NOTE: This *Interval* setting is not available on the *Options – One Minute* tab. Trade and Quote data is much larger in volume and size than Trade Only data (2000-3000X), and therefore processing times will be considerably longer.**

### *Company Info*

Will include a folder in the *Output Directory* that contains information about each security processed in the Job, including splits, dividends, and mergers, as well as translation information for converting Tick Data Company IDs to current ticker symbols. For more information about the contents of the *CompanyInfo* folder, please see the *File Format Guide* for the corresponding exchange, located on your data disc/drive and also available on Tick Data's website:

http://www.tickdata.com/html/downloads.shtml

### *Empty Intervals*

These selections are not active when **Trades, Tick Based Bars, or Quotes** are selected as the *Interval*. For all other intervals, they give important options for handling empty time intervals. Empty intervals occur when there are no trades during the full length of a bar.

**Skip Empty Intervals**: Any interval without data is excluded from the file. There will not be a timestamp. The only drawback to this method comes if a user is working in a spreadsheet, as there will not be an equal number of prints each day.

**Hold Last Value:** Holds the value of the close of the last bar to have a price through all intervals until another price occurs. This guarantees the number of bars per day is constant, but creates artificial bars.

**Fill With Zeroes:** Any empty interval will have a zero (0) value for the Open, High, Low, Close, and Volume. This also guarantees the number of bars per day is constant, but if it is graphed, the zeroes will cause the chart to be useless.

### *Extend Last Interval*

Active when *Time Based Bars* is selected at the *'Interval'*, this parameter is useful if there are not an even number of intervals in a single day, based on the bar interval the user selected in *Granularity*. For example, the U.S. stock market opens at 9:30 and closes at 16:00 EST. If the user selects '60' for the *Granularity*, there is not an even number of 60-minute bars in the day. If *Extend Last Interval* is not checked, there will be a 16:30 bar that only contains 30 minutes of data (15:30:00-15:59:59). However, if **Extend Last Interval** is checked, the last bar of the day will be a 15:30 bar that contains 90 minutes of data (14:30:00-15:59:59).

### *Begin Date/End Date*

By default, the begin and end dates will both say *MM DD YYYY*. When *MM DD YYYY* is displayed, the complete date ranges for each individual symbol in the list of checked symbols will be used by the corresponding symbol. However, this can be overridden by entering begin and/or end dates in the appropriate boxes.

The buttons to the right of the *YYYY* field will pull up calendars that can assist users to enter dates.

### *Days Back to Process*

Instead of creating a file with a specific date range, a user may want to look at data only for the past *x* days. This setting is especially useful if such a client subscribes to daily updates, as a file can be updated automatically each night to only reflect trading for the past *x* days.

## *Session(s) to Include*

Many stock exchanges offer extended trading hours in addition to their regular trading hours. In the U.S. regular market *Day Session* hours are 9:30 to 16:00 EST. However, trading in the *Pre*-Market session begins several hours earlier, and *After-Hours* trading continues for several hours. In order to include *Pre-Market*, *Day Session*, and/or *After-Hours* trading in output files, users simply need to check the appropriate box(es).

## *Start Session At/End Session At*

By default, the *Start Sessions At* and *End Sessions At* fields are inactive and display *00:00.* Set this way, TickWrite will write out all of the data for the sessions chosen for each day. If the user selects multiple symbols, the file for each symbol will be written out with the respective session hours of each. However, users can also confine the data for all selected symbols to a particular time range each day.

To activate these fields, check the boxes to the left of the *Start Sessions At* and/or *End Sessions At* fields (you can use either or both). Then enter the desired hours and minutes in 24-hour (military) time.

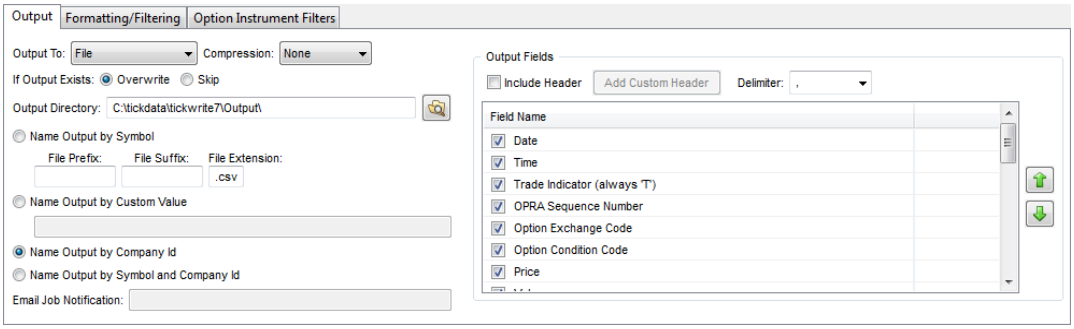
**NOTE: These fields can only be used to *restrict* normal market hours (including day and night sessions).** For example, if normal markets hours run from 07:00 – 19:00, the Start Session At must be equal to or after 07:00 and the End Session At must be equal to or less than 19:00. The custom session hours may not cross over two market days.

**NOTE: Using *Start Sessions At* and/or *End Sessions At* will deactivate the Pre-Market/Day Session/After-Hours checkboxes under *Session(s) to Include*, as the times entered will override the standard session settings.**

## *Output and Formatting/Filtering*

The bottom section of the Job window contains two tabs with parameters for output type, file naming, output fields, and formats.

### Output Tab:




**Output To:** Output data to a file or to the screen. If *File* is selected, the user must select the Output parameters on the tab. If *Screen* is selected, all other Output parameters deactivate (except for the *Output Fields* section). Screen output data can be copied in the window (select multiple fields using the *Shift* and *Ctrl* buttons) and pasted into spreadsheets and text editors like **Word** or **Notepad. NOTE: Pasted data will use the *Delimiter* set in *Output Fields*; in order to copy fields into separate cells in a spreadsheet, use *Tab* as the delimiter.**

**Compression:** The user can write out ASCII files that are unzipped (full-size output files) or compressed using *Zip* or *Gzip*.

**If Output Exists:** Determines how TickWrite will handle file creation if a file by the same name already exists in the output directory.

> **Overwrite Existing**: The existing file will be deleted and recreated according to the parameters in the job. The user will not be warned that the existing file will be overwritten.
>
> **Skip:** The extraction job will leave the existing file untouched and not extract new data.

**Output Directory:** Enter the desired location of output files. This must be chosen prior to processing data to a file. As with all parameters, this location can be set as a default by selecting SETUP -> Tab Defaults -> Set Current Values as Default for Tab. **NOTE: As with all defaults, the *Output Directory* set in a tab will only affect that tab.**

**Name Output by Symbol / Name Output by Company Id / Name Output By Symbol and Company id:** Will use the symbol and/or company ID of the instrument as the filename. These options also allow users to include a file prefix and/or suffix and select the file extension.

**Name Output by Custom Value:** Allows the user to choose the filename of the output ASCII file. **NOTE: Active only when one symbol is selected.**

**Email Job Notification:** Once you have entered valid SMTP server settings in *Preferences*, enter a valid email address in this field to email notifications of Job success or failure, along with an attached .twj Job file.

**DATE WILDCARDS IN FILE PATHS:** TickWrite7 supports date wildcards that can be used in the output directory, file prefix, file suffix, and custom file name. The wildcards will resolve to the current date and/or time as of when the collection job is first executed. This can be used to dynamically create new directories/files based on the current date without the need to create custom scripts. To utilize a wildcard, it must be denoted ${ and } in the literal value. The following are the supported wildcards:

> **yyyy – current year**
>
> **MM – current month**
>
> **dd – current day of month**
>
> **HH – hour of day (0 – 23)**
>
> **mm – minute of hour**

For example, the following output directory might be entered:

**C:\temp\${yyyy-MM-dd}\TRADES**

Assuming that today is April 16th, 2010 this would resolve to the following directory name:

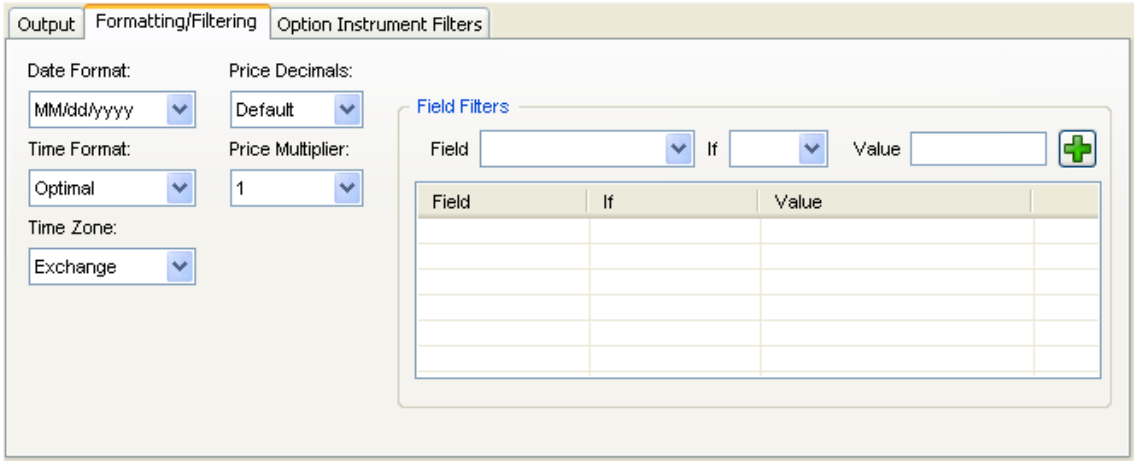
**C:\temp\2010-04-16\TRADES**

**Output Fields:** Active whether the user selects *Screen* or *File* as the '*Output To'*, here the user can make choices about the fields within the data file. The field delimiter can be chosen here by selecting *Space*, *Tab*, or by entering whatever character you wish to use (comma ',' is the most commonly-used character). Finally, choose the fields you wish to include in the file. The up and down arrows to the right of the *Field Name* list allows users to move fields up and down. The available fields will change depending on the *Interval* and *Exchange* selected. For more information about each field, please see the *File Format Guide* for each exchange's data,

which should be included with purchased data but is also available on Tick Data's website: http://www.tickdata.com/html/downloads.shtml.

**File Header:** You can optionally elect to include a header as the first line in each output file by checking the Include Header checkbox. By default, the header row will include the name of each field, in the specified order, delimited by the specified delimiter. However, if you would like to change the standard header to a custom value, you can do so by clicking the Add Custom Header button entering your own header. This is useful if your internal systems require a certain header or you need to name the output fields differently. Note that the custom header is written exactly as entered; if any changes are made to the field selection the custom header must be changed accordingly.

## Formatting/Filtering Tab:




**Date Format:** Select the desired date format for the output file.

**Price Decimals:** Used to select the desired number of decimal places in the output file. *Default* is set by default, and will use the standard number of decimal contained in the source data (which differs by exchange). The user can also force TickWrite to output a specific number of decimal places by selecting from the list.

**Time Format:** Select the desired time format. Since some data Tick Data offers has a millisecond stamp, while others have only a second stamp or even only a minute stamp, by selecting *Optimal*, TickWrite will use the proper time format. Alternately, the user can choose a specific time format from the list.

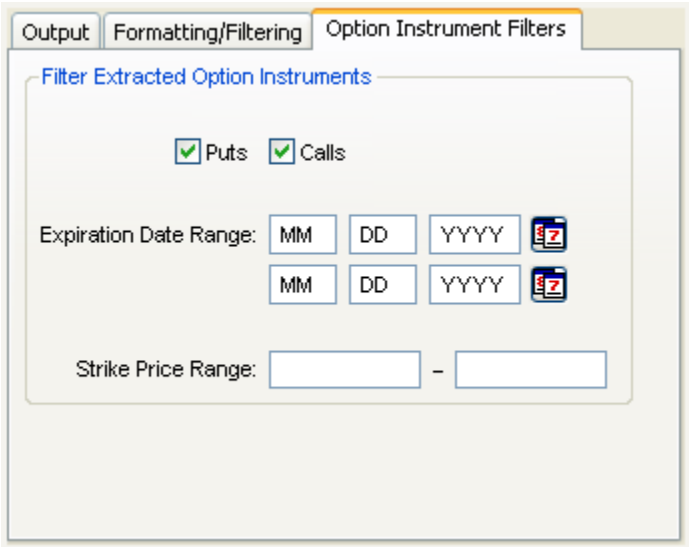
**Price Multiplier:** Activated when checked, this parameter allows users to factor in a multiplier to the entire output file. This multiplier must be a factor of 10, but can be a decimal (i.e. .001, .1, 10, 100, etc.).

**Time Zone:** TickWrite has the ability to output data in various time zones. This is especially helpful when working with data from an exchange that is not in your country, as some countries have different schedules for adjusting for Daylight Savings Time. The three choices are **Exchange Time Zone** (default), **Local Time Zone**, and **GMT**. **Exchange Time Zone** will output the data in the time zone of the exchange on which it is traded. For Indices, this generally means the exchange on which the futures contract is traded. The **Local Time Zone** value is derived from the time zone to which your computer is set. Please be sure your computer's clock is set properly. **GMT** is Greenwich Mean Time, the international baseline time zone. GMT does not adjust for Daylight Savings Time, so depending on the time of the year, the number of hours from one time zone to GMT varies. TickWrite handles this automatically.

**Field Filters:** This feature allows users to filter output data and only display data meeting the desired parameters. The fields available for filtering vary based on the *Interval* and *Exchange* selected. Select your filter parameters and click the 'plus' sign. To remove a filter or all filters, right-click in the field display window to show a context menu.

If you wish to filter by two parameters in the same field, separate the Values with commas and use IN and/or NOT IN filters. For example, if you wanted to only include trades with Exchange Codes 'N' and 'S', you would enter 'Exchange Code' in *Field*, 'IN' in *If*, and 'N,S' in the *Value* field.

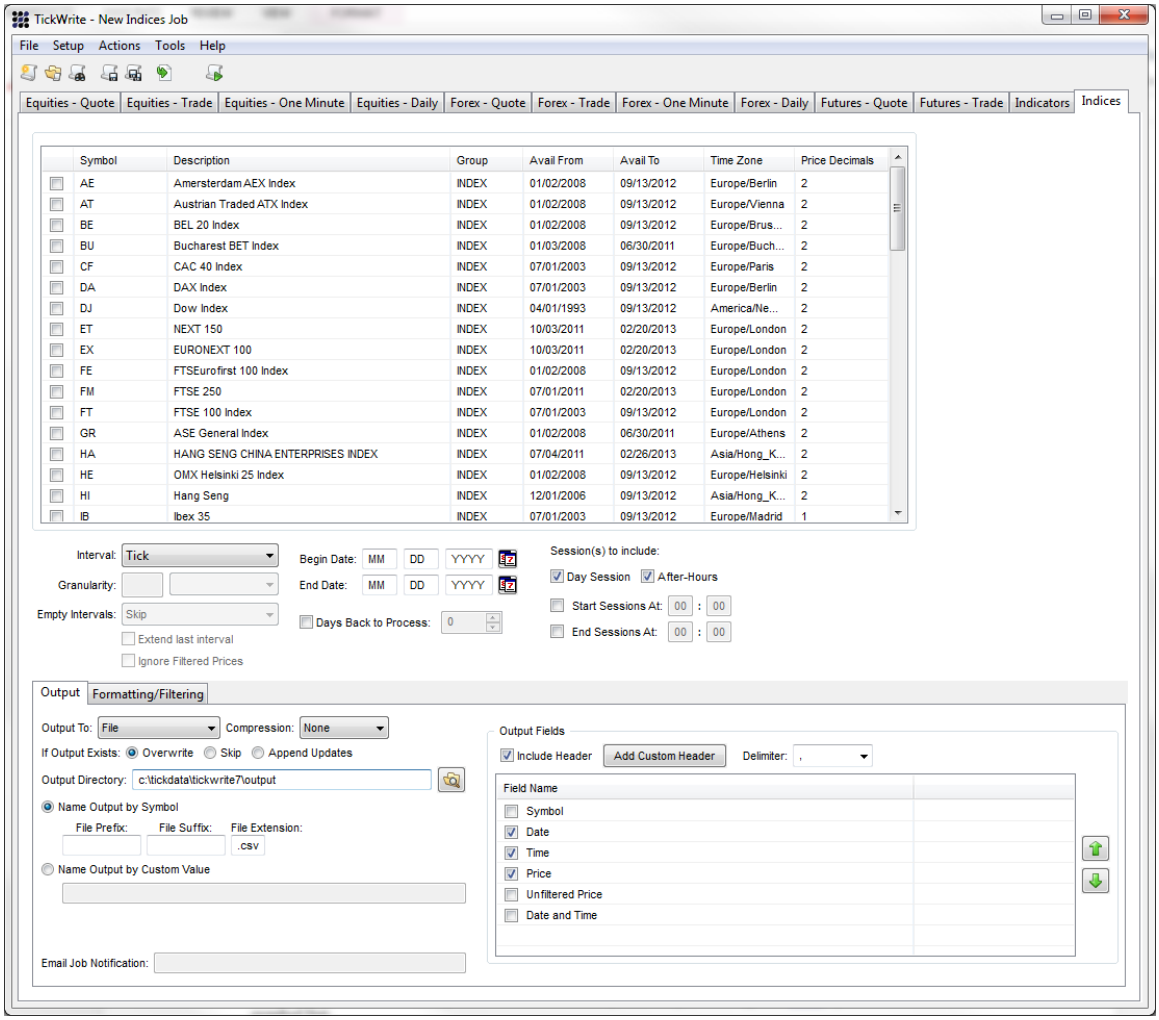
## Option Instrument Filters Tab:




The parameters on this tab are used to narrow the selection of files output by a Job. These parameters will pertain to all symbols selected for processing, so it is advisable to only process one underlying option symbol per job when using the *Strike Price Range* parameter.

## Creating Files of Cash Index and Indicator Data

Cash Indices and Indicators are handled almost identically by TickWrite 7, so the instructions and details are the same for both. Here is the Indices Job window:




Your available Index/Indicator symbols and date ranges will appear in the data list at the top of the window. You can manually select one or more symbols by checking the box(es) to the left of the symbol list.

Right-click anywhere in the symbol list to activate a context menu with the option to check all symbols, un-check all symbols, or invert selection. To check many symbols at once, you can import a list of symbols. Simply list your desired symbols in a text file, one per line, and save it as a *'.txt'*, *'.csv'*, or *'.asc'* file. Click Actions -> Import Symbol List, and browse to select your saved file. When OPEN is clicked, the symbols in the file will be checked in the data list. Please note that any symbols that were checked prior to importing a list will be unchecked (unless they are also on the list).

The screen will activate different settings depending on: 1) how many symbols are selected; 2) the *Granularity* selected, and; 3) the *Output To* selected.

The following are details for each Job window parameter:

### *Interval*

**Tick:** The output file will contain all ticks for the selected time period. Since a 'tick' is a single data point, there is no OPEN, HIGH, LOW, or CLOSE; just a single price at which a trade

occurred. Users will also note that there is no way to output 'Tick Count' when ***Tick*** is selected as the *Interval*. This is because each tick has a 'Tick Count' of 1. Also of note is that 'Tick Count' is basically irrelevant in the case of *Indices*, which are calculated on a mostly constant interval, meaning the 'Tick Count' will not vary significantly.

**Tick Based Bars:** Users can also write data out as multi-tick bars. When ***Tick Based Bars*** is selected, users can define the number of ticks that will comprise each bar, instead of using a time interval to constrain a bar. In the *Granularity* box, you must specify the number of ticks per bar. Each line of data in the output file is time-stamped with the time of the last tick in each bar.

**Time Based Bars:** When selected, TickWrite outputs files of any desired intraday time interval from 1-second bars up. Each line of data can contain Date, Time, Open, High, Low, Close, Volume (if available), Tick Count, Up Ticks, Down Ticks, and/or Same Ticks for that interval. In the *Granularity* box, you must specify the length of a bar interval in whole seconds or whole minutes. Adjacent is a field to select MINUTES or SECONDS.

The timestamp for each interval represents the data of the period ending immediately prior to the timestamp. For example, when using 5-minute bars, the 8:35 bar contains data from 8:30:00 to 8:34:59. As another example, when using 30-minute bars, the 4:00 bar contains data from 3:30:00 to 3:59:59.

**Daily/Weekly/Monthly Bars:** These intervals will output files of 1-day, 1-week, or 1-month intervals, respectively.

## *Empty Intervals*

These selections are not active when **Tick** or **Tick Based Bars** are selected as the *Interval*. For all other intervals, they give important options for handling empty time intervals. Empty intervals occur when there are no trades during the full length of a bar.

**Skip Empty Intervals**: Any interval without data is excluded from the file. There will not be a timestamp. The only drawback to this method comes if a user is working in a spreadsheet, as there will not be an equal number of prints each day.

**Hold Last Value:** Holds the value of the close of the last bar to have a price through all intervals until another price occurs. This guarantees the number of bars per day is constant, but creates artificial bars.

**Fill With Zeroes:** Any empty interval will have a zero (0) value for the Open, High, Low, Close, and Volume. This also guarantees the number of bars per day is constant, but if it is graphed, the zeroes will cause the chart to be useless.

## *Extend Last Interval*

Active when *Time Based Bars* is selected at the *'Interval'*, this parameter is useful if there are not an even number of intervals in a single day, based on the bar interval the user selected in *Granularity*. For example, the U.S. stock market opens at 9:30 and closes at 16:00 EST. If the user selects '60' for the *Granularity*, there is not an even number of 60-minute bars in the day. If *Extend Last Interval* is not checked, there will be a 16:30 bar that only contains 30 minutes of data (15:30:00-15:59:59). However, if **Extend Last Interval** is checked, the last bar of the day will be a 15:30 bar that contains 90 minutes of data (14:30:00-15:59:59).

## *Ignore Filtered Prices (Cash Indices only)*

Active when creating **Tick** or **Time Based Bars** from *Tick Trade data*, this parameter allows the user to generate bars using raw, unfiltered prices. If unchecked, bars are built using prices that may be altered by Tick Data's proprietary price filtering algorithm.

### *Begin Date/End Date*

By default, the begin and end dates will both say *MM DD YYYY*. When *MM DD YYYY* is displayed, the complete date ranges for each individual symbol in the list of checked symbols will be used by the corresponding symbol. However, this can be overridden by entering begin and end dates in the appropriate boxes.

The buttons to the right of the *YYYY* field will pull up calendars that can assist users to enter dates.

### *Days Back to Process*

Instead of creating a file with a specific date range, a user may want to look at data only for the past *x* days. This setting is especially useful if such a client subscribes to daily updates, as a file can be updated automatically each night to only reflect trading for the past *x* days.

### *Session(s) to Include (Cash Indices only)*

For some cash indices, ticks continue to update for several minutes after the market officially closes. Therefore, TickWrite provides an After-Hours session that will include these ticks that are time stamped past the close. To only extract ticks that are within the official market hours, a user can uncheck the After-Hours session and leave only Day Session selected.

### *Start Session At/End Session At*

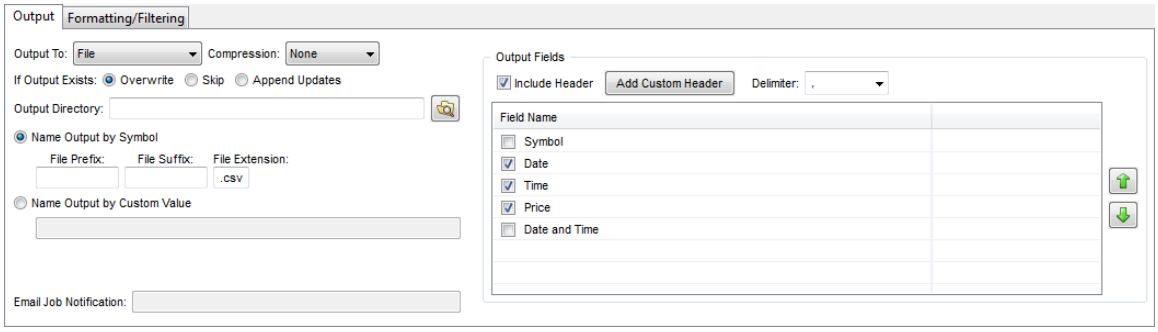
By default, the *Start Sessions At* and *End Sessions At* fields are inactive and display *00:00.* Set this way, TickWrite will write out all of the data for the sessions chosen for each day. If the user selects multiple symbols, the file for each symbol will be written out with the respective session hours of each. However, users can also confine the data for all selected symbols to a particular time range each day.

To activate these fields, check the boxes to the left of the *Start Sessions At* and/or *End Sessions At* fields (you can use either or both). Then enter the desired hours and minutes in 24-hour (military) time. The *End Sessions At* value will act as the close of the day, and the last tick of the session will be the last tick BEFORE the closing time entered.

### *Output and Formatting/Filtering*

The bottom section of the Job window contains two tabs with parameters for output type, file naming, output fields, and formats.

#### Output Tab:




**Output To:** Output data to a file or to the screen. If *File* is selected, the user must select the Output parameters on the tab. If *Screen* is selected, all other Output parameters deactivate (except for the *Output Fields* section). Screen output data can be copied in the window (select

multiple fields using the *Shift* and *Ctrl* buttons) and pasted into spreadsheets and text editors like **Word** or **Notepad. NOTE: Pasted data will use the *Delimiter* set in *Output Fields*; in order to copy fields into separate cells in a spreadsheet, use *Tab* as the delimiter.**

**Compression:** The user can write out ASCII files that are unzipped (the largest output files) or compressed using *Zip* or *Gzip*.

**If Output Exists:** Determines how TickWrite will handle file creation if a file by the same name already exists in the output directory.

> **Overwrite Existing**: The existing file will be deleted and recreated according to the parameters in the job. The user will not be warned that the existing file will be overwritten.
>
> **Append Updates:** When selected, TickWrite will attempt to append data in an existing file using data generated by the job. This selection should primarily be used by clients who subscribe to daily updates and have jobs scheduled to download and process out the same data every day. It will decrease processing time, as the job will begin where the existing file leaves off.
>
> **Skip:** The extraction job will leave the existing file untouched and not extract new data.

**Output Directory:** Enter the desired location of output files. This must be chosen prior to processing data to a file. As with all parameters, this location can be set as a default by selecting SETUP -> Tab Defaults -> Set Current Values as Default for Tab. **NOTE: As with all defaults, the *Output Directory* set in a tab will only affect that tab.**

**Name Output by Symbol:** Will use the symbol of the instrument as the filename. This parameter also allows users to include a file prefix and/or suffix and select the file extension.

**Name Output by Custom Value:** Allows the user to choose the filename of the output ASCII file. **NOTE: Active only when one symbol is selected.**

**Email Job Notification:** Once you have entered valid SMTP server settings in *Preferences*, enter a valid email address in this field to email notifications of Job success or failure, along with an attached .twj Job file.

**DATE WILDCARDS IN FILE PATHS:** TickWrite7 supports date wildcards that can be used in the output directory, file prefix, file suffix, and custom file name. The wildcards will resolve to the current date and/or time as of when the collection job is first executed. This can be used to dynamically create new directories/files based on the current date without the need to create custom scripts. To utilize a wildcard, it must be denoted ${ and } in the literal value. The following are the supported wildcards:

> **yyyy – current year**
>
> **MM – current month**
>
> **dd – current day of month**
>
> **HH – hour of day (0 – 23)**
>
> **mm – minute of hour**

For example, the following output directory might be entered:

**C:\temp\${yyyy-MM-dd}\TRADES**

Assuming that today is April 16th, 2010 this would resolve to the following directory name:

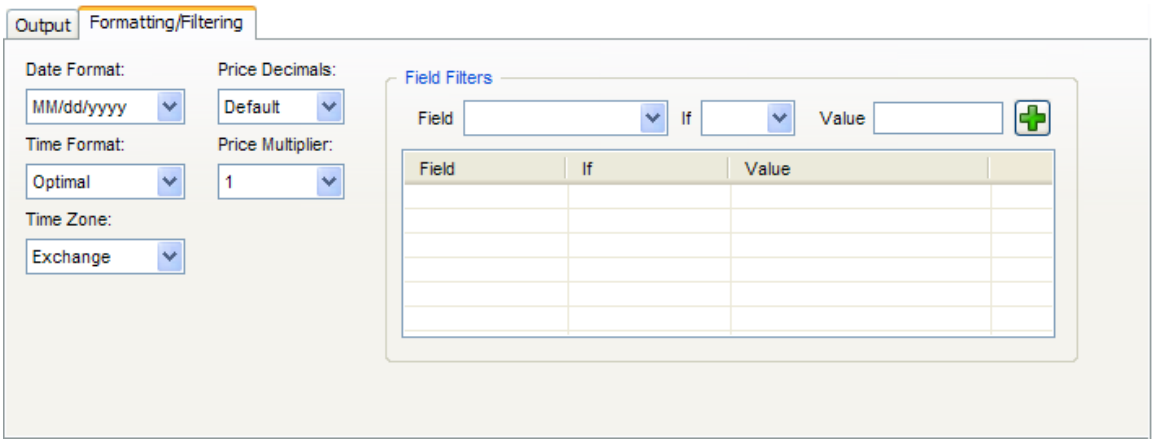
**C:\temp\2010-04-16\TRADES**

**Output Fields:** Active whether the user selects *Screen* or *File* as the '*Output To'*, here the user can make choices about the fields within the data file. You can choose whether or not to

include a header row that shows the field names at the top of each file. The field delimiter can be chosen here by selecting *Space*, *Tab*, or by entering whatever character you wish to use (comma ',' is the most commonly-used character). Finally, choose the fields you wish to include in the file. The up and down arrows to the right of the *Field Name* list allows users to move fields up and down. **NOTE: Rearranging the field order will slow down file creation speed.**

**File Header:** You can optionally elect to include a header as the first line in each output file by checking the Include Header checkbox. By default, the header row will include the name of each field, in the specified order, delimited by the specified delimiter. However, if you would like to change the standard header to a custom value, you can do so by clicking the Add Custom Header button entering your own header. This is useful if your internal systems require a certain header or you need to name the output fields differently. Note that the custom header is written exactly as entered; if any changes are made to the field selection the custom header must be changed accordingly.

## Formatting/Filtering Tab:




**Date Format:** Select the desired date format for the output file.

**Price Decimals:** Used to select the desired number of decimal places in the output file. *Default* is set by default, and will use the standard number of decimal places required for the contract. The user can also force TickWrite to output a specific number of decimal places by selecting from the list.

**Time Format:** Select the desired time format. Since some data Tick Data offers has a millisecond stamp, while others have only a second stamp or even only a minute stamp, by selecting *Optimal*, TickWrite will use the proper time format. Alternately, the user can choose a specific time format from the list.

**Price Multiplier:** Activated when checked, this parameter allows users to factor in a multiplier to the entire output file. This multiplier must be a factor of 10, but can be a decimal (i.e. .001, .1, 10, 100, etc.).

**Time Zone:** TickWrite has the ability to output data in various time zones. This is especially helpful when working with data from an exchange that is not in your country, as some countries have different schedules for adjusting for Daylight Savings Time. The three choices are **Exchange Time Zone** (default), **Local Time Zone**, and **GMT**. **Exchange Time Zone** will output the data in the time zone of the exchange on which it is traded. For Indices, this generally means the exchange on which the futures contract is traded. One notable exception is the DJIA cash index data, which is in Eastern Standard Time even though the DJ futures contract is traded in CST on the CBOT. The **Local Time Zone** value is derived from the time zone to which your computer is set. Please be sure your computer's clock is set properly. **GMT**

is Greenwich Mean Time, the international baseline time zone. GMT does not adjust for Daylight Savings Time, so depending on the time of the year, the number of hours from one time zone to GMT varies. TickWrite handles this automatically.

**Field Filters:** This feature allows users to filter output data and only display data meeting the desired parameters. For index/indicator data, you can only filter based on price. Select your filter parameters and click the 'plus' sign. To remove a filter or all filters, right-click in the field display window to show a context menu.

## Executing Jobs via the Command Line

In addition to graphical user interface (GUI), certain TickWrite functionality can also be accessed from the command line:

- **Execute a job file** – the job must be created first using the TickWrite user interface and saved to a file; you then reference the saved file to execute the job; it is also possible to override the parameters in the job file as command line switches. Although it would be very verbose, it is also possible execute a job consistently entirely of command line switches (no job file).
- **Download data** – this feature can be used to check for updates from a custom script that a user may have developed.
- **Interact with the TickWrite Scheduler** – activate, deactivate, execute or delete scheduled tasks.
- **Generate a Change Report** – create a text file report of all data files that have been modified since a given date/time; see Appendix E for more details.

**NOTE: Beginning with the 20150615 release of TickWrite 7 for Linux, all command line switches must first have a –*args* switch. Linux users of previous versions should upgrade to the latest version of TickWrite 7. Windows users should not include the -args switch.**

For full details and examples of commands, please reference the command line help by typing the following at the command prompt from the directory where TickWrite is installed:

Windows: **TickWrite –help**

Linux: **TickWrite –args –help**

Users can use the -f switch to run an extraction from the command line. There are three options:

1) The -f switch can be followed by one or more Job files. For example:

   Windows: **TickWrite -f C:/temp/JOB1.twj C:/temp/JOB2.twj**

   Linux: **TickWrite -args -f C:/temp/JOB1.twj C:/temp/JOB2.twj**

2) Users can override any number of parameters in the Job file on the command line. For example:

   Windows: **TickWrite -f C:/temp/JOB1.twj C:/temp/JOB2.twj -START_DATE 01/01/2011 -END_DATE 01/31/2011**

   Linux: **TickWrite -args -f C:/temp/JOB1.twj C:/temp/JOB2.twj -START_DATE 01/01/2011 -END_DATE 01/31/2011**

In this case, the start date and end dates contained in JOB1.twj and JOB2.twj are ignored and 01/01/2011 and 01/31/2011 is used instead.

3) Users supply a complete list of parameters on the command line. For example:

   Windows: **TickWrite -f -OUTPUT_CONTRACT ALL -WORKING_JOB true -COLLECTION_TYPE COLLECTION_TYPE.FUTURES -EXTRACT_TYPE COLLECTOR_SUBTYPE_FUT_TICK_DAILYBAR -REQUESTED_DATA 8|AD[20110202],224|AU[20110202] -START_DATE 08/01/2010 -**

**END_DATE 01/30/2011 -DESTINATION_DIRECTORY C:/temp/TIK-673 -INCLUDE_HEADER_ROW true -OVERWRITE_EXISTING false**

Linux: **TickWrite -args -f -OUTPUT_CONTRACT ALL -WORKING_JOB true -COLLECTION_TYPE COLLECTION_TYPE.FUTURES -EXTRACT_TYPE COLLECTOR_SUBTYPE_FUT_TICK_DAILYBAR -REQUESTED_DATA 8|AD[20110202],224|AU[20110202] -START_DATE 08/01/2010 -END_DATE 01/30/2011 -DESTINATION_DIRECTORY C:/temp/TIK-673 -INCLUDE_HEADER_ROW true -OVERWRITE_EXISTING false**

Note that the -f switch still must be used, but no file name is necessary here.

Please keep these points in mind:

- All other switches (such as -mail and -verify_symbols) are still supported.
- The -f switch and (optional) list of Job files must appear first. However, the order of all other parameters does not matter and they can be supplied in any order.
- The format of a parameter that is overriding a Job file parameter is: -NAME_VALUE The parameter name must be preceded with a dash (-) and it is separated from its value by a space (NOT an equals sign). So if the name of the parameter is START_DATE, the format should be -START_DATE 01/01/2011
- The names and values of parameters should be exactly as they appear in the .twj Job file. Any values that contain spaces MUST have double quotes around the value when specified on the command line.
- The best approach to using the Command Line is to create a Job in the TickWrite GUI, save it, and open it in a text editor to see the names of the various parameters, which to use, and how to input values.

## Appendix A: Network Connectivity Requirements

With the introduction of features like daily updates and multi-user installations, TickWrite 7 is a networked-enabled application that depends on certain network access being available in order to function properly (as opposed to TickWrite 6 which functioned as a purely standalone application). Network connectivity is required for both receiving updates for Tick Data as well as normal TickWrite operation. These are each discussed below:

## Data Updates from Tick Data

If you subscribe to data updates from Tick Data, an Internet connection from the machine on which TickWrite is installed is required (at least during the times when the updates will be run). All data updates will be handled by Tick Data's update server cluster under the host name **tw-update.tickdata.com.** TickWrite handles encryption of all sensitive data (e.g. user account information) before being transmitted.

By default, all TickWrite updates are retrieved using the Hyper-Text Transfer Protocol (HTTP) at port 80. This is suitable for nearly all users as HTTP is widely support and the least problematic with organizational firewalls. In certain customer environments, HTTP connectivity is restricted by use of a proxy server. In this case, you may need to enter the details about your proxy server by going to Setup -> Preferences and selecting Connection Settings. Here you can enter your organization's proxy server information as well as proxy server credentials if they are required. This is the same information you might enter into your web browser in order to establish Internet connectivity. If you do not know your organization's HTTP proxy server information, please consult your IT department for assistance (Tick Data is NOT able to provide this information to you).

The connectivity to Tick Data's update server can be tested from within TickWrite at any time by going to:

Help -> Test Connection To Update Server

It is a good idea to do this after installation or after adding/editing any connection settings (e.g. proxy server info) in order to ensure that TickWrite can still connect to get data updates.

While not very common, it is possible to have TickWrite connect for updates directly over a TCP socket (as opposed to using HTTP) at port 11100. The update behavior is identical to using HTTP, but this should generally only be enabled if there is a problem using HTTP. To change to use TCP, please go to Setup -> Preferences from within TickWrite and select Connection Settings. Optionally, the name of a SOCKS proxy can be entered for use with TCP updates if your organization requires it. Again, the connection can be tested from within TickWrite by going to:

Help -> Test Connection To Update Server

## TickWrite Operation – Single Installations

Because of the TickWrite scheduler and other features, TickWrite 7 utilizes a service process that runs in the background. Therefore, even a single installation of TickWrite 7 still makes use of network ports. However, because connections are only made back to the same host, firewalls should almost never be a problem. Additionally, TickWrite has attempted to use higher, non-standard ports to avoid conflicts with existing applications. The below information on port usage is intended as a reference only and port numbers only need to be changed or configured when it is shown that there is a problem or conflict. Currently, there are two static ports and one dynamic port used in TickWrite (dynamic ports are dynamically chosen at application startup based on availability on the host system).

The static ports are 12092 and 12093 and they must either be available on the system or set to alternate available ports. To change TickWrite to utilize different ports, create the following text file:

<TICKWRITE_ROOT>/config/user-configs/custom_ports.properties

In this file, add the following lines:

TW_METASERVER_PORT=<something_besides_12092>
TW_RMI_PORT=<something_besides_12093>

You can optionally add comments lines to the file as long as they are preceded by the # character.

Regarding the dynamic port, it should not conflict with any other ports since it is automatically selected from available ports on the system. However, if you do need to makes this port static, you may do so by adding the following line to the custom_ports.properties files created above:

TICKWRITE.TICKWRITE_SCHEDULER.SERVICE_PORT=<some_port>

## TickWrite Operation – Multiple Install Environments (e.g. Site Licenses)

In an environment with multiple TickWrite installations, one installation is designated as the primary installation. Other installations are known as client or workstation installations. Workstation installations must be able to communicate with the primary installation. Additionally, because of the scheduler functionality, all TickWrite installations make use of a background service with which it must communicate. All of this communication takes place using TCP ports. Firewalls are generally not an issue because communication is confined to the Local Area Network (LAN). Additionally, TickWrite has attempted to use higher, non-standard ports to avoid conflicts with existing applications. Therefore, in most cases there should be no configuration necessary with regard to network ports. The below information on port usage is intended as a reference only and port numbers only need to be change or configured when it is shown that there is a problem or conflict.

The primary installation makes use of two static ports and one dynamic port (dynamic ports are dynamically chosen at application startup based on availability on the host system). The static ports are 12092 and 12093. To change TickWrite to utilize different ports, create the following text file:

<TICKWRITE_ROOT>/config/user-configs/custom_ports.properties
In this file, add the following lines:

TW_METASERVER_PORT=<something_besides_12092>
TW_RMI_PORT=<something_besides_12093>

You can optionally add comments lines to the file as long as they are preceded by the # character.

Regarding the dynamic port, it should not conflict with any other ports since it is automatically selected from available ports on the system. However, if you do need to makes this ports static, you may do so by adding the following lines to the custom_ports.properties files created above:

TICKWRITE.TICKWRITE_SCHEDULER.SERVICE_PORT=<some_port>

A workstation installation makes use of one static port (12093) and one dynamic port. If you need to make port changes on a workstation installation, the process is similar to the instructions for the primary installation. Create the custom_ports.properties file add the following lines:

TW_RMI_PORT=<something_besides_12093>
TICKWRITE.TICKWRITE_SCHEDULER.SERVICE_PORT=<some_port>

Additionally, if you changed the port numbers of the primary installation, you will need to configure each workstation with these modified port numbers. This can be achieved by adding the following two lines to the custom_ports.properties:
TW_METASERVER_PORT=<TW_METASERVER_PORT_ON_PRIMARY_INSTALL>
TW_CENTRAL_RMI_PORT=< TW_RMI_PORT_ON_PRIMARY_INSTALL>

## TickWrite Operation –Special Standalone Mode

For customers who use TickWrite on single computer AND by only one user at a time, you have the option of running TickWrite in special "standalone" mode. As discussed above, even a single instance of TickWrite utilizes a background process and network communication. While this setup offers many advantages and powerful features, it may be undesirable for certain users that have TickWrite installed on a single computer.

In standalone mode, no network communication is utilized and TickWrite operates as a single desktop application. However, there are some limitations to running TickWrite in standalone mode which include:

- The TickWrite Scheduler is disabled; all data updates and extraction jobs must either by run from the GUI or command line interface (you could, however, use your operating system scheduling utility to run TickWrite commands).
- TickWrite is limited to performing one operation at a time (only one extraction job or data update at a time can occur). If you attempt to open multiple instances of the TickWrite GUI, you will receive an error message on the second and subsequent attempts.
- Workstation installations on other machines are not supported.

The above limitations are not intended to penalize a user for running in standalone mode but are, unfortunately, necessary to avoid possible data corruption that might otherwise occur.

If you wish to enable standalone mode, it must be done manually, but it is a relatively simple, one time setup.

1) Shut down TickWrite GUI if it is running.
2) On a Windows machine, you should disable the TickWrite Service. Go to Start -> Run and type services.msc This will present the Microsoft Windows Services applet. Scroll down and locate the TickWrite Service. Right click and select Stop to stop the service if it is Started. Then right click again, select Properties, and set the Startup Type to Disabled. Click OK to save.
   **NOTE: These actions require administrative rights on the computer.**
   **NOTE: You could optionally uninstall the service but we do not recommend this as it makes it more difficult to revert back to normal mode if necessary.**
3) On a Linux machines, kill any TickWrite processes that are running on the machine.
4) Create the following text file:

   <TICKWRITE_ROOT>/config/user-configs/standalone.properties

   In this file, add the following line:

   STANDALONE_TICKWRITE=true

5) Restart TickWrite and it will be running in standalone mode.

**NOTE: If you wish to back up any .properties files before making changes, do not store the back-up files in the \config folder or any subdirectories therein; TickWrite will read every properties file in \config and its subdirectories regardless of their locations.**

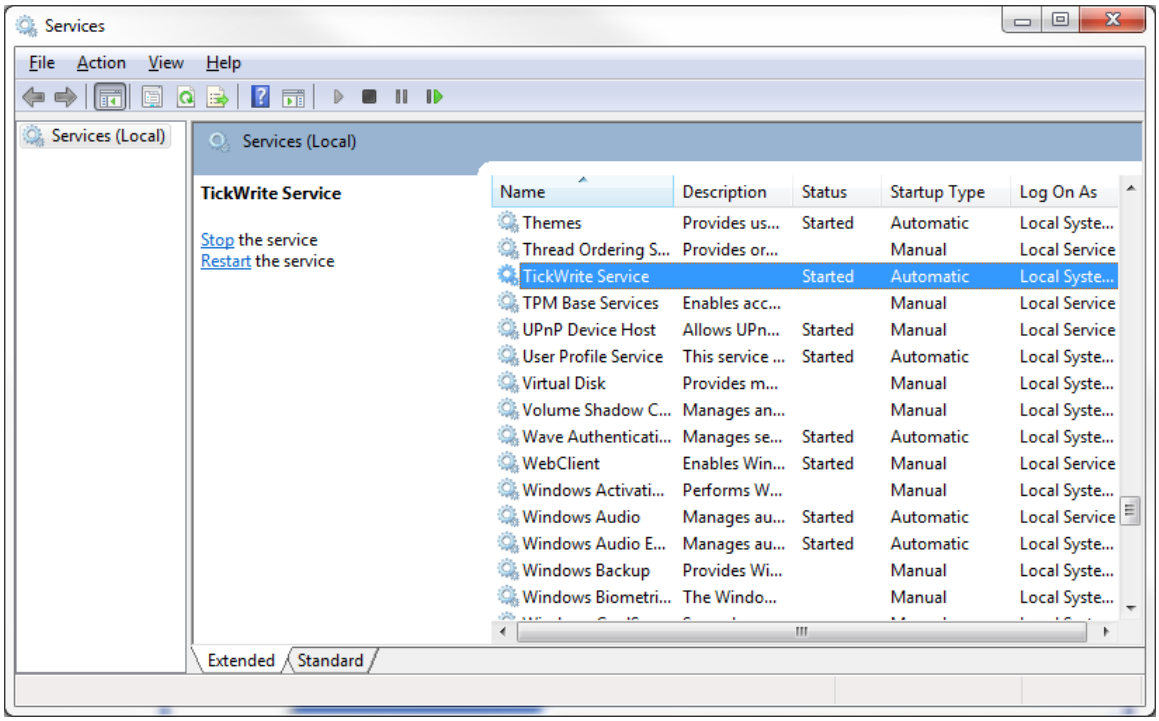
## Appendix B: Special Notes for TickWrite on Microsoft Windows Machines

When TickWrite is installed on Microsoft Windows machines, it utilizes a "Windows Service" for certain functionality, including the TickWrite Scheduler. By using a Windows Service, TickWrite is able to run scheduled tasks while the TickWrite UI is not running and even when you are logged off your machine.

To view and manage the TickWrite Service, do one of the following:

- Right click My Computer, select Manage, drill down on Services and Applications, and select Services
- Alternatively, go to Start -> Run and type "services.msc" (without the quotes)

You will be presented with the Microsoft Windows Services Applet where you can find the TickWrite Service:




***NOTE: You may not be able to access or modify Windows Services if you do not have administrative privileges on your machine. In this case, you will need the assistance of your IT department.***

By default, the TickWrite Service is configured to Log On As the LocalSystem account. This configuration works fine if your Deep History (i.e. data files), your job files, and your output directories are all local locations (e.g. all on local hard drives such as C:\ or D:\). However, if you are using a network location, this is a problem because for security reasons the LocalSystem account cannot access network locations (this is a restriction imposed by Microsoft and Tick Data has no control over this).

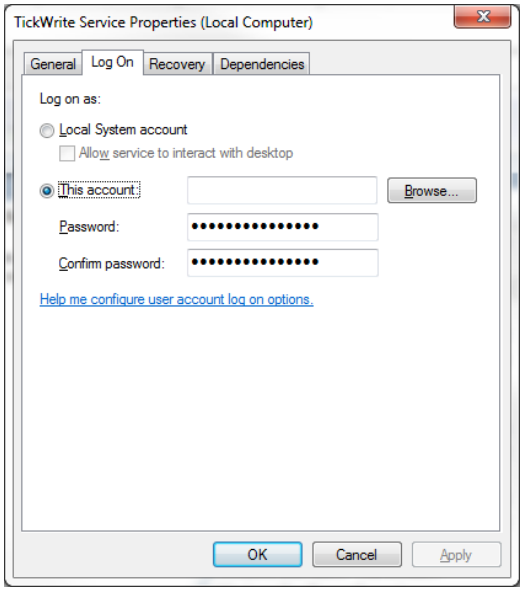
For example, it is very common for TickWrite to be configured such that the Deep History data resides on a network device that has a large storage capacity. While you would be able to run jobs without any problem from the TickWrite GUI, any jobs you attempt to automate using the TickWrite scheduler would fail because the TickWrite Service running under LocalSystem is not allowed to access this network location.

The solution for this is the modify the TickWrite Service's Log On As setting to a user account that has the appropriate access to the network. Usually, you can just modify it to run as the same user account that you use to log into the computer.

***NOTE: You only need to follow the below steps if your installation of TickWrite references network locations. If you operate on a single computer in a standalone environment where all your data and jobs reside on the same machine, you do not need to take any action.***

Follow these steps to modify the Log On As setting:

- Right click the TickWrite Service in the Microsoft Windows Services Applet and select Properties.
- Select the Log On As tab as shown below:




- Select the "This Account" radio button and type in your user ID in the text box to the right. Usually, your user id needs to be proceeded by your organization's domain. For example, if you organization's Windows domain is "TICKDATA" and your user id is "tickwrite", you would enter "TICKDATA\tickwrite" (without the quotes).
- Enter and confirm the user's password in the fields provided.
- Click OK to confirm your changes. If there is some problem such as an incorrect password, Windows should alert you. If you do not have sufficient privileges to modify a service, you will need to seek help from your IT department.

The new user settings for the service will stay in effect indefinitely and will persist even if your machine is rebooted. However, if you need to upgrade your installation of TickWrite to a newer version, the service will be deleted and reinstalled. Therefore, you must re-perform the above steps whenever your upgrade TickWrite to a newer version.

Once this change is in place, the TickWrite Scheduler will be able to access any network locations the specified user account can access. However, one additional restriction imposed by Microsoft is that Window Services are not able to utilize mapped network drives. It is quite common for users to map frequently used network locations to available drive letters on their computer. For example, a location on a network device might be mapped to the V:\ drive on your computer. If this is where you want your data files to reside, you might have configured your Deep History location to be something like V:\TICKWRITE_DATA. Again, while this setting will work fine when running extractions from the TickWrite GUI, any job automated via the TickWrite Scheduler will fail because it is unable to resolve the V:\ drive.

The solution to this is to not reference mapped network drives within TickWrite configuration and to instead use UNC style paths. For example, the V:\ drive might be mapped to the share MYSHARE on the machine MYMACHINE. In this case instead of setting up the Deep History location to be V:\TICKWRITE_DATA, you would use the UNC path:

\\MYMACHINE\MYSHARE\TICKWRITE_DATA

which avoids use of the drive letter and is a location that can be resolved by the TickWrite Scheduler.

Generally speaking there are three places to ensure that UNC paths (or local paths like C:\) are used:

- Deep History Locations – these are initially set up during installation as part of the configuration wizard. However, they can be edited after installation by going to the following menu in TickWrite: Set Up -> Preferences and drill down on DEEP HISTORY LOCATIONS. Review the paths used under each items and ensure that mapped network drives are not used.
- Output directories in job files – for any jobs that are scheduled, open those jobs in the TickWrite GUI and ensure that Output Directory defined (at the bottom on the Output tab) is not using a mapped network drive letter.
- The path to job files within schedule tasks – access the scheduler within TickWrite by going to Set Up -> Scheduler. For each task defined, select Edit and select the Jobs tab in the dialog that comes up. Ensure that the path to any job files defined are not using mapped network drive letters and change to UNC paths if necessary.

## Appendix C: Special Notes for TickWrite on Linux Machines

### TickWrite Service

A TickWrite installation on a Linux machine utilizes a background service/process known as the TickWrite Service. The use of this background service allows the TickWrite Scheduler to execute tasks when the TickWrite GUI is not running or if no user is currently logged into the machine. Additionally, on a primary installation, the TickWrite Service runs a lightweight metadata server to support TickWrite workstation installations on other machine on the network.

By default, the TickWrite Service will be automatically started upon installation of TickWrite. Additionally, whenever the TickWrite GUI (or command line) is run, the TickWrite Service will be started if it is not already running.

However, due to the platform differences in various versions of Linux, the TickWrite Service does not come up automatically after a machine reboot. This can pose a potential problem if scheduled tasks are set up to download data updates or run jobs at regular intervals. For example, if the machine is rebooted and no user opens the TickWrite GUI or runs a TickWrite command, the TickWrite Service does not get restarted. Therefore, any scheduled tasks will not run during this time.

The solution to this is to create a custom script that starts the TickWrite Service and configure that script to be run each time the system is rebooted. The TickWrite Service can be started by invoking the TickWriteWindow executable with the following parameters (all on one line):

TickWriteWindow–Dlog_file_name=TICKWRITE_SERVICE.log
com.tickdata.tickwrite.centralnode.TickWriteCentralNode

### Kernel Settings for running TickWrite

When extracting data during normal use, TickWrite 7 may require many files to be opened simultaneously. If the user account running TickWrite 7 is not properly set up, corruption can occur when running large jobs. We recommend changing the */etc/security/limits.conf* file so the "hard locks" is set to 28000. For example, where user ID = **tickdata**, the settings should be:

| | | | |
|---|---|---|---|
| tickdata | soft | nofile | 1024 |
| tickdata | hard | nofile | 65636 |
| tickdata | soft | noproc | 2047 |
| tickdata | hard | noproc | 16384 |
| **tickdata** | **hard** | **locks** | **28000** |
| tickdata | soft | locks | 14000 |

## Appendix D: TickWrite Data File Change Report

Tick Data will at times make corrections to certain data. While these corrections will be automatically downloaded into the customer's deep history, many customers desire to know what files have been impacted since a certain point. Therefore, TickWrite offers a Data File Change Report that can be generated by customers. This report can either be generated from the TickWrite user interface or from the command line. To generate this report from the user interface, go to the Tools menu and select Data File Change Report.

To generate a report from the command line, type the following command from the directory where TickWrite is installed:

TickWrite –cr –help

This will print complete details about the required and optional switches as well as examples of how to generate the change report from the command line.

Depending on the amount of data for which a customer is licensed, the report will take anywhere from a few seconds to several minutes to generate. The change report generated is an ASCII file that is human readable but that can also be easily parsed by a script or program that the customer might choose to develop. The report contains the following format:

1) CHANGE_REPORT_SINCE_DATE: Contains the date and time specified for change report
2) MARKET_HEADER: Contains the name of the market and dataset that follows
3)
    a. **For equity markets**
       FILE: Path to file, last modified timestamp of file
    b. **For futures, indices, and indicators**
       OUTER_FILE: Path to monthly zip file, last modified timestamp of file
       ENTRY_FILE: Name of zip entry inside of outer file, last modified timestamp of entry
       *Repeat ENTRY_FILE for each entry modified since date/time specified for report*
4) MARKET_SUMMARY: Total number of change items for this market

*Repeat items 2 – 4 for each market that is part of the change report*

5) TOTAL_SUMMARY: Total number of changed items for all markets in the change report

Please see below for an example report run that includes two market/data set combinations:

```
CHANGE_REPORT_SINCE_DATE:2010-02-15 17:45

MARKET_HEADER:FUT,TRADE_DB

OUTER_FILE:C:\DATA\FUT\C\CF\2009_12_CF.zip,2010-03-31 22:49

ENTRY_FILE:2009_12_CF_SUMMARY.asc.gz,2010-03-11 13:37

ENTRY_FILE:CFF10_2009_12_31.asc.gz,2010-03-11 13:36

ENTRY_FILE:CFG10_2009_12_31.asc.gz,2010-03-11 13:36

ENTRY_FILE:CFH10_2009_12_31.asc.gz,2010-03-11 13:36

OUTER_FILE:C:\DATA\FUT\E\EN\2009_12_EN.zip,2010-03-31 22:49

ENTRY_FILE:2009_12_EN_SUMMARY.asc.gz,2010-02-23 19:07

ENTRY_FILE:ENH10_2009_12_11.asc.gz,2010-02-23 19:07

MARKET_SUMMARY:6

MARKET_HEADER:US_TED,TIMEBAR_DB

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_04_X.zip,2010-03-31 22:12
```

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_05_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_06_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_07_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_08_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_11_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_12_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_13_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_14_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_15_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_19_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_20_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_21_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_22_X.zip,2010-03-31 22:12

FILE:C:\DATA\US_TED\2010\01\OMB\2010_01_25_X.zip,2010-03-31 22:12

MARKET_SUMMARY:15

TOTAL_SUMMARY:21

## Appendix E: Moving a TickWrite Installation to Another Computer

For a variety of reasons, you might find that you need to move your TickWrite installation from one computer to another. Because a TickWrite installation may contain many custom settings, these tips offer a shortcut for getting your new installation up and running without needed to reconfigure everything you already did.

**NOTE: These tips should work in most situations, but if problems occur you may need to perform a fresh installation.**

**1)** Uninstall from the old machine. Always use the uninstall program included with TickWrite and found in the TickWrite installation directory (on Windows computers, there should also be an Uninstall item off of the Start menu).

**2)** Note that after the uninstall completes, some directories and files are left behind and not deleted. These files represent your custom settings such as scheduled tasks, extraction jobs, data file location configurations, and possibly the data files themselves. Do NOT delete these files; they will be used later in this process.

**3)** Use the installer to install on the new machine. After the installation part completes, the configuration wizard will come up where it asks you whether this is a Primary Installation of Workstation Installation. At this point, click Cancel to exit the wizard. You do not need to complete the wizard at this time.

**4)** Copy all the files left behind from the uninstall from Step 2 to the new installation. Be sure that the directory structure remains intact so that all files are copied to the corresponding locations in the new installation. Overwrite any existing files.

**5)** Start up TickWrite; if the main window comes up, then you have successfully completed the move. If the configuration wizard comes up again, it most likely means that you version you have just installed is newer than the version you uninstalled from the old computer. In this case, complete the configuration wizard to complete the move (all your relevant custom settings have still been imported).

There are a couple special considerations to keep in mind when performing the move:

- The instructions above assume that you are installing to the same location on the new computer. For example, if the old computer was installed at C:\TickData\TickWrite7 it is assumed that it is installed to the same location on the new computer. If this is not the case, then it is possible that your Deep History Root locations (i.e. data file locations) are not correct. Please verify the paths by going to Setup -> Preferences -> DEEP HISTORY LOCATIONS and correct if necessary.

- If the installation that was moved was a primary installation AND your organization has one or more workstation installations, those workstations installations need to be updated to reference the new primary installation. The easiest way to do this is actually to reinstall each workstation as this ensures its version is consistent with the primary (a requirement of TickWrite7). On each workstation, simply uninstall using the uninstall program and reinstall to the same location. On the first page of the configuration wizard change the primary installation host name to the new value and complete the wizard. This workstation is now up to date and synced with the new primary installation. All custom settings such as scheduled tasks, job files, etc. on the workstation installation are still in place. However, the one final thing to verify on the workstation installation is that its own Deep History Root locations are still correct (since the primary installation was moved, these would be incorrect if the data files resides within the primary installation). On the workstation installation, please go to Setup -> Preferences and select DEEP HISTORY LOCATIONS. Review all paths provided and correct if necessary.

If you have any questions please call (703) 757-1370 during normal business hours 8a.m. – 6 p.m. (Eastern Time) or e-mail us at support@tickdata.com.

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